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ABSTRACT

A project was conducted to design and field-test a prevocational program of recruitment, instruction, advising, counseling, and placement for women considering careers in science and technology fields. Additional objectives were to directly assist women in coping with constraints inhibiting them from entering such fields and to compile the program elements and project results into a useful, transportable guide for other institutions of higher education in the state of Washington. A set of methods was devised to locate suitable students, increase faculty awareness of the project, identify and gain support of successful science/technology resource women in the community, and create an advising booklet. Instructional procedures emphasized the development of an integrated career counseling course that focused upon individual decision making within a supportive interpersonal environment. A pre- and post-test design was utilized that included unpublished tests, standardized tests, and case studies. By the completion of the course, approximately 68% of the 54 participants were actively planning to enter sci/tech careers. Twenty-two women were engaged in training in a sci/tech field along with an additional 10 training for other careers. Over 90% of the participants obtained a clear confirmation. Additional accomplishments pertained to increased convictions with regard to the necessity for college supportive systems as crucial for such a project and course. Revisions based on participant reactions were made and the component retested. (Author/BM)

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FINAL REPORT

CAREERS FOR WOMEN IN SCIENCE AND TECHNOLOGY:
A MODEL TREATMENT PROGRAM

CURRICULUM DEVELOPMENT PROJECT
CONDUCTED UNDER
PUBLIC LAW 90-576
TITLE I, PART C, SEC. 131(b)

The project reported herein was performed pursuant to a grant from the Research Coordinating Unit of the Washington State Commission for Vocational Education. Contractors undertaking such projects under the Commission for Vocational Education sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Commission for Vocational Education position or policy.

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U.S. DEPARTMENT OF HEALTH,
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PREFACE

Since it is highly likely that people with quite varied backgrounds will want to examine this report, we have chosen to present the body in a brief but general manner. Thus we have reserved the Appendices for all the more detailed information which is best suited to various subgroups of people working in colleges and universities. For example, those who regard the financial aspects of greatest interest when considering a program will find the Budget listed immediately after the Bibliographies. Others may wish to first consult the Table of Contents to confirm which section or Appendix is most important or interesting to them.

Administrators may want to read the Goal and Objectives before they consult the third chapter, Results and Accomplishments. Program evaluation specialists will most likely be interested in the Impact of the Course and Outcomes of the Experience, and Chapter IV as well as the instruments used in evaluation. Program directors responsible for women's services will most likely find the Appendices on Publicity and Advising very interesting. Instructor/counselors will need to review Offering the Course before examining the highly specific Appendix on Instruction. They may also be curious about the evaluation instruments and process.

SUMMARY

The development, implementation, and evaluation of the Careers for Women in Science and Technology Project took place between March 1, 1978 and December 11, 1978, with the concluding meeting of the Advisory Committee. During those nine months essentially all the following project objectives were successfully completed: design and field-test a pre-vocational program of recruitment, instruction, advising, counseling, and placement for mature women considering careers in science and technology fields; directly assist women cope with constraints inhibiting them from entering such fields; and compile the program elements with the results of the project into a useful transportable guide for other institutions of higher education in the State of Washington.

A wide array of procedures were implemented. A set of methods were devised to locate suitable students, increase awareness of the need and the project by faculty, identify and gain the support of successful science and technology resource women in the community, and create an advising booklet. Instructional procedures emphasized the development of an integrated career counseling course which focused upon individual decision-making within a supportive interpersonal environment. The inclusion of specialist workshop leaders in science, mathematics, anxiety reduction, work communications, engineering, technological trades, and computers in an instructional procedure which establishes the uniqueness of this project. The last set of procedures implemented consist of an evaluation of the nature and extent of the impact of the experience. Evaluation procedures were both superimposed upon the course and incorporated into the instruction. During the two instructional quarters a pre- and post-test design using unpublished tests, standardized tests, and case study summaries followed different methods.

The project resulted in many specific accomplishments most of which center upon the outcomes for the 54 participants. Women who were expressing insecurity, tentativeness, and extensive indecisiveness about their career futures along with a compelling desire to seek confirmation about their hopes for finding work in science and technology, by the completion of the course (N = 46), were actively planning to enter sci/tech careers (68.5% of 54). A total of 22 were engaged in training in a sci-tech

Summary (Continued)

field along with an additional 10 in training for other careers. Over 90% of the participants obtained a clear confirmation.

Additional accomplishments pertain to increased convictions with regard to the necessity for college supportive systems as crucial for such a project and course. Continued refinements in the course and in the specific workshop components through thoughtful review of participant reactions has also been accomplished and retested.

There appears to be, in conclusion, a clear continuing need for this sort of "sex-equity in occupations" effort. Continuing to offer this course as conceived and developed in this project will create pressures in most colleges regarding funding and staffing. The uniqueness of the course appears to inherently generate simultaneous problems accompanying the high levels of success. However, the combination of extensive need and the existence of methods effective in meeting these needs results in a recommendation that ongoing and enlarging efforts occur in Washington State colleges and State funding agencies.

ACKNOWLEDGEMENTS

The federal funding for this project was managed by the staff of the Washington State Commission for Vocational Education. Particularly helpful to the program were Gene Bigger, Director of the Research Coordinating Unit; John Moen of the same Unit; and Beverly Postlewaite, Director of the Sex Equity Office. This was our supportive beginning. The Advisory Committee freely gave of their time:

George Donovan, Director of Counseling
Phillip H. Swanberg, Placement Center Director
Robert R. Beardemphl, Occupational Programs Director
Elizabeth Plunkett, Boeing Engineer
Marie M. Gilstrap, Biology Instructor
Ruth Hendricks, Mathematics Instructor
Marta M. Creswell, Engineering Student
Elizabeth E. Colasurdo, Coordinator of Women's Programs
Diane DeWitt, Course Instructor

Many women gave time to the project in the form of an hour interview as a preliminary step to becoming a "resourse person:" fourteen women have been guest speakers in the classroom, information field interview participants numbered the same or more, and others became involved in referring students to other helpful people. Faculty people who conducted the specialized workshops provided absolutely critical experiences for the course participants and were highly rated by the class:

Gina Erickson, Sciences
Ruth Hendricks, Mathematics
Joy Fehrenz, Computers
Roger Powell, Engineering
David Brown, Technological Trades

However, the students who participated in this project win the top prize. They did a fantastic job of self-selection into the class by somehow knowing, without being able to articulate, that they wanted entry into a science or technology occupation. The responsiveness was far beyond original expectations and the benefits derived by the women appear to be equally great.

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CHAPTER I: INTRODUCTION

Problem and Need Statement

The Current Situation:

Careers in science and technology have not traditionally been chosen by women. According to statistics compiled for 1967-77 by the Washington State Commission for Vocational Education in 1978, community college technical programs in Washington have twelve percent female participation. Except for electromechanical technology, which was ninety-nine plus percent female, each occupational area under "technical" had twenty-seven percent or less female enrollment. These figures have been substantiated by Elizabeth Boyer (1974):

> "From a fair sampling of the two-year, tax-supported institutions offering technical-occupational programs . . . . enrollment of women is still slight and increasing only very gradually, either numerically or percentage-wise as compared to male enrollments."

The problem these occupational program statistics illuminate is not just faced by community college vocational programs. Community colleges also prepare students to transfer to four-year programs in which solid grounding in science and mathematics are necessary background. Sciences seem to provoke anxiety in many women which results in low enrollment. Math anxiety plays a large part in determining individual career choices. A well-known study of women enrolling at the University of California at Berkeley showed that few women selected career fields in which four years of high school mathematics were necessary, including such fields as business administration and architecture. Women students were concentrated in those few areas where less math was required: art, English, speech, education and sociology. Math was not necessary for women's "traditional" disciplines. Lack of math precluded other choices.

The Resultant Need:

Why should this picture change? Fine minds and skilled people are needed in scientific and technological fields and both sexes can supply them. Because science and technology increasingly impact our life-styles including our moral choices, women should be participants in the design and management of technology. To be outside is to be essentially disenfranchised. Most women work for money of necessity a substantial portion of their adult lives. Income disparity between men and women, even when both work full-time, has been well-documented. Women often support themselves and children. Husbands and wives both need to work to maintain their standard of living. Jobs in science and technology pay better than many traditional "women's jobs" requiring a comparable amount of training. Careers in science and technology should be options for women and society should be supporting their efforts to enter and progress in these fields.

Those women already into science and technology commonly seem to have had an atypical amount of support from family members, friends, and teachers; often including from men. With this support they have overcome those subtle pressures which seem to steer other women away from acquiring a background in math and science or from work environments dominated by men. Women are capable of and interested in entering scientific and technological fields but because they initially lacked support and encouragement are they to be denied this choice later? "Careers for Women in Science and Technology" will bring to women students some exposure to wider career choices, encouragement to try new avenues of learning, self-evaluation of interests, strengths, and skills, and in some measure, substitute for support which the earlier women pioneers in these fields have had. They will then become new pioneers ... 1980 style.

Project Goal and Objectives

Our goals were (1) to design and test at Highline Community College, by September 30, 1978 a pre-vocational program of recruitment, instruction, advising, and placement for women considering careers in fields of science and technology, (2) to help women overcome cultural and educational constraints inhibiting them from entering such fields, and (3) to compile the designed and tested program elements into a useful and transportable guide for other institutions of higher education in the State of Washington.

Administration and Support Objectives:

1. To develop a recruitment process for the pre-vocational class

Project Goal and Objectives (Continued)

which encourages the involvement of appropriate prospective and re-entry students. To involve instructors of science and technology and locally employed women scientists and technologists in this process.

2. To increase the level of awareness of the Highline College staff, who advise and teach women students, regarding educational and employment opportunities for women in science and technology, as well as those constraints which prevent women from selecting these career fields.

   a. To compile a comprehensive digest of recent literature regarding educating and placing women in scientific and technological careers and jobs.

   b. To interview 30 employed women, supervisors, and male colleagues of employed women in order to establish between these people and appropriate college staff a communication network. To establish for women students field survey opportunities, role models and potential mentors. To exchange ideas on recruitment, instruction, employment, and overall encouragement for women interested in these careers.

   c. To examine, compile, and disseminate to the college staff information on occupational programs in science and technology at post-secondary educational institutions in King County: course content, prerequisites, and employment for which the programs are designed.

Instruction and Evaluation Objectives:

1. To create and conduct a five-credit pre-vocational class which will assist up to 30 women students to increase their level of decidedness about a career in a science or technology occupation.

   a. To provide opportunity for individual self-assessment related to career identity through standardized tests and class activities. Result: Clarify Career Identity.

Project Goal and Objectives (Continued)

b. To intervene in future potential hazards by reducing anxiety reactions to mathematics, sciences, technologically-oriented courses and programs, and training and work settings which are predominately male by teaching methods with broad applications. Result: Reduce Anxiety Reactions

c. To inform and clarify the training, education, and job requirements as well as the work conditions and issues for various typical science and technology careers through use of instructors and speakers in science, technology, and math. Result: Increase Reality Orientation

d. To communicate a "take charge of your life" outlook as well as "no guarantees" and "it's hard work" through examples provided by people visiting the classroom.
Result: Raise Self-Esteem

e. To provide a consistently supportive class environment with people who are peers, caring, searching, and easily available, while teaching basic, empathetic, and assertive communications skills. Result: Raise Self-Esteem

f. To offer a means whereby diverse information can be planfully integrated into a "whole" using a set of temporal objectives which support the occupational goal statement in a written Plan of Action. Result: Make Effective Career Decisions

g. To provide individual advising, upon completion of the class, regarding appropriate methods, resources, programs and alternatives as next steps in career development.
Result: Increase Purposefulness

2. To assess the effect of the pre-vocational class on those who completed the course by measuring changes which have occurred over time on self-perception as it relates to career identity, level of career decidedness, and general self-esteem.

a. To select and use published standardized tests, tests being developed, private individual counseling, advising and debriefing interviews, and survey methods in an effort to identify significance of any impact.

b. To compile individual case studies as well as group statistics to help indicate the levels of success obtained and the nature of any "failures."

c. To prepare a report which will communicate the content and process of the class, the results of evaluation, and the accomplishments in general in order that other interested colleges may better consider offering a similar program.

CHAPTER II: DESCRIPTION AND PROCEDURES

Administrative Project Support

The project coordinator assumed responsibility for recruiting the prospective students and handled all inquiries about the course. She also worked on increasing the faculty and staff awareness about non-traditional work including this course in particular, arranged for the interviews of the resource women, and created the advising booklet. Institutional support systems were established. A description of each follows.

Recruitment of Students:

A public relations outreach effort to recruit students for the course was never fully developed or implemented due to the more than adequate response to some very limited efforts. These efforts included:

1. An announcement in the April, 1978 Women's Program Newsletter which went to a list of 1,500.
2. A 2" x 2" article on the bottom of the last page of the Highline Community College Summer Bulletin mailed in May to 120,000 homes.
3. A small news article carrying the same information printed in the weekly area newspapers and in one Seattle daily.
4. A printed brochure detailing the course content, naming instructors, listing occupations in science and technology, asking questions of the prospective student to test out her interests, and containing a registration blank. It was sent to 1,500 women on the Highline College Women's Programs mailing list, to libraries, other women's centers in the area, as well as to those already indicating an interest. (By the time these brochures had been printed in late May over 50 women had already indicated interest.)

A waiting list was developed from those inquiring after the summer class was filled: some women had delayed calling and others had been urged to place their name on the list by students already in the Summer class. Because applications for the class continued to arrive after the

Administrative Project Support (Continued)

class was filled, the Women's Programs Director negotiated with the Occupational Programs Director for funds to offer the course in Fall Quarter, 1978, as a way to meet waiting list obligations related to women seeking non-traditional science and technology careers. This allowed the staff to continue making a list. The developer-instructor was asked to teach the Fall class. Because the Fall class could yield comparative data likely to be helpful in evaluating the project, the reporting date was extended.

In preparation for Fall another brochure was printed while women on the waiting list were given first opportunity. Articles similar to those printed for the Summer class were again placed in the Continuing Education Bulletin and the area newspapers. No recruitment efforts were ever directed at local high schools. Many inquiries occurred as a result of the course being free but some others called because publicity emphasized career exploration. Those not appropriate to course goals were referred to regular career exploration groups.

Awareness of College Staff:

In late March, 1978, the project coordinator attended a national conference in Phoenix, Arizona. The focus was to learn more about the current status of efforts to move women and men into non-traditional careers and to examine psychological and social elements in this process. The participants spent a major portion of the conference developing plans for their own institutions. The project coordinator chose to plan for a task-force approach at the college, which would involve everyone from the president to the support staff in identifying ways to attract and meet the needs of non-traditional students of all kinds. The main goal would be to have the potential non-traditional student view the educational opportunities and supporting services at Highline Community College as those which could be of personal benefit.

In late May, 1978, the entire college staff of over 500 received three publicity and information items: 1) the brochure, 2) a one-page digest of the literature which describes the need for such a project, and 3) a cover letter explaining the hope for greater staff awareness and support. In September, 1978, a full-page article appeared in the college staff newspaper, summarizing the project activities to that point and listing the accomplishments of the classroom and advising elements of the project.

Interviews of Resource People:

Between April and December, 1978, 30 contacts were made with employed women in science and technology careers. Both the coordinator and instructor completed on-site interviews. The project goals were introduced and active support in roles such as class speaker were requested. Interview summaries were completed and compiled. Contacts were developed in the variety of ways listed:

1. Previous appearance on a Highline College Women's Programs panel.
2. Names of former students, referred by Highline faculty.
3. Interviewees suggesting people within their organization or professional community.
4. Leads from news articles and program pamphlets.
5. Friends, acquaintances and class members.
6. Women volunteering to assist after having read about the class.

Educational Advising Booklet:

Current printed catalogues and occupational program literature from all King County community colleges and vocational-technical institutes, the Highline programs, and the University of Washington were carefully read and notes compiled. Accuracy of the information was verified by telephone with every institution except the University. A booklet to be used for advising has been created: "Occupational Programs and Disciplines in Science and Technology at Public Institution of Higher Education in King County."

Institutional Support Systems:

In addition to performing necessary routine administrative tasks, the program coordinator made adjustments as deemed necessary in the activities and scope of the project. Major adjustments in the project were: 1) assumption by the instructor of some of the community resource people interviews, 2) assumption by the instructor of additional advising responsibilities, 3) publication postponement of the educational advising booklet until late in the project, and 4) deletion of the clipping of news articles about women in science and technology due to lack of articles.

The Women's Resource Center served as the focus for all the supporting activities of the project. Because space was limited, the instructor, of necessity, used the Women's Resource Center for storing materials and for the planning and advising which could not be done at home or in the classroom. Staff handled inquiries and the waiting list. The Advisory Committee consisting of 9 people met 3 times.

The first meeting, on April 12, 1978, centered on introducing the project objectives, staff, recruitment plan, and the total project activity time line; the second, on June 28, 1978, dealt almost exclusively with course content and students' reactions to their class experience to that date. Many questions were responded to by the instructor.

The focus of the third meeting, on December 11, 1978, was upon results and evaluation. Preliminary evaluation data were presented by the instructor. A discussion of the next steps to be taken then followed. The committee instructed the coordinator to begin the process of "finding a permanent home" for the course at Highline. Transferring the course to other colleges was contemplated.

Offering the Project Course

The course instructor assumed responsibility for developing, instructing, and evaluating the impact of the course. She assumed the tasks of selecting and adapting several divergent approaches used in individual career counseling into a consistent and integrated set of procedures suitable for a group of up to 30 women participants. The hoped for outcome was to create a smooth career-decision-making process, integrate it with specialized workshops which address issues regarding the science and technology fields, include basic survival-skill instruction in a supportive atmosphere, and determine if the anticipated level of success was obtained. A description of the instruction follows.

Offering the Project Course (Continued)

Overview of the course:

The dominant emphasis in the course is intrapersonal self-assessment by means of activities which assist each individual participant to complete a career decision-making process while maintaining privacy. Secondary to the primary emphasis is the establishment of group career counseling procedures which are intended to meet interpersonal needs by supporting more communal goals by creating and maintaining colleagiality. A friendly supportive classroom atmosphere encourages each participant to risk self-disclosure which at times is a form of self-assessment but which also allows for the development of relationships with women who have similar career interests.

Broad Instructional Intentions:

The course has six broad objectives which apply in turn to each participant. Each of these objectives are emphasized at different times in the instructional sequence with various in-class activities and homework assignments. It is intended that each woman will be able to

1. Acquire and clarify a career identity or vocational self-perception by means of individual self-assessment procedures such as the Strong-Campbell Interest Inventory (SCII) or other standardized tests.
2. Reduce anxiety reactions as they related to male-dominated non-traditional work and to obtaining training in the sciences, mathematics, and technological fields by means of group practice sessions of different types of clinical techniques used for this purpose such as progressive relaxation and systematic desensitization.
3. Increase the orientation to reality by acquiring realistic perceptions regarding work, jobs, careers, lifestyles and the current potential in the science and technology occupations by means of information gathering techniques such as meeting with guest professional women.
4. Raise self-esteem and decrease self-defeating behaviors by

means of early establishment of a consistently supportive in-class environment mixed with a "taking charge" and "organizing your own luck" attitudes optimistically communicated by instructor, guest, and student behaviors such as offering positive feedback and having specific instruction in assertiveness.

5. Make effective career decisions by learning about individual style differences by means of specific activities which aid in this procedure such as gathering information from human and written resources which are to be incorporated into a written Plan of Action.
6. Increase purposefulness and begin to make an increased number of informed decisions regarding career development and management by means of taking action on the plan and later confirming the appropriateness of the action such as enrolling in preliminary mathematics classes to confirm skills needed in the chosen field.

It is intentional that the emphasis in this report be on the instructional objectives and rationale and not upon the specific methods or materials used by any particular instructor/counselor. Each instructor is usually skilled at certain methods and familiar with certain materials and will select those over any newly-recommended but strange ones. The only exception to this would be the necessary assumed inclusion of such a widely accepted tool of career counseling as the SCII or with such obviously important method such as having a written Plan at the course conclusion which allows integration of the experience which produces a sense of direction for each participant. Furthermore, several of the materials reviewed in Appendix C apply to more than one of the above objectives.

Selection of Methods and Materials:

There are three main topics to be covered in any complete career counseling experience: vocational interests, marketable skills, and work values.

Offering the Project Course (Continued)

Roughly about one-third of the course time was assigned to each topic. The aforementioned SCII measures interests and is the most widely accepted standardized test in current use. Career counseling clients and students essentially always take this test. It provides valued comparisons with women and men in numerous careers and a comparison of particular value for a group counseling procedure: the Holland typology as a method of conceptualizing work environments and individual workers. Therefore, these test results were combined with other information and by means of the Holland typology each participant was able to select a "temporary vocational identity" for the purpose of examining later course material. Of considerable additional help is the fact that science and technology fields are predictably dominated by only some Holland types and this provided an early assessment of the degree of suitability for these careers.

The second main topic covered was the issue of identifying marketable skills. The major tool used for this purpose in the course was the advanced version of the Quick Job-Finding Map assigned both in class and at home. Peers are used as a resource in-class and participants are encouraged to assess essentially those skills which pertain to their Holland code or previously identified vocational interests.

The third main topic of work values demanded some creative work from the instructor to adapt tools which are not standardized and not published. Additionally, direct instructional attention was given to decision making, handling obstacles to a career entry or change, and goal setting.

Other than the SCII and the Maps mentioned above it is appropriate to regard none of the other specific methods or materials used in the course as the only correct approach. It is highly probable that the transfer to another instructor the specific approaches used here would result in failure because the comfort and expertise of the newer instructor would have been interfered with. Furthermore, it is somewhat likely that in the effort to manage someone else's materials, the understanding of the broad instructional intentions and their rationale would be lost. Therefore, it is appropriate to regard the two appendices on instruction only as lists of activities to consider using depending upon a variety of learner variables.

Offering the Project Course (Continued)

The selection of any method and the accompanying materials should relate to the speed or intensity of instruction which is in-part determined by the educational background and intellectual functional level of the students. In this particular class lifestyle seems to relate to learning style as well as to the selection procedures. So attention should be given to age, marital status, parent or not, work history, current employment situation, and any combinations of these variables.

Of considerable significance to the counseling process of this course is the interference in good decision making which is common when a person is in crisis, has very low self-esteem or poor decision making skills, or lacks either motivation or overall maturity. It would be ideal to find alternative sources of help for these people because group methods or classroom materials which can handily compensate for these particular attributes or situations would not suit the majority of the women in the course.

Women who are interested in science and technology careers are rather different from women-in-general and as career counseling participants. Their learning style and preferences set them apart to such a degree that specific methods needs to be applied in order to effectively help them.

The looser knit and flowing, self-actualizing, artistic, and predominantly social atmosphere of the usual career counseling small group experience would not be attractive to these women and they would soon withdraw. They prefer precision, direction. solitary learning, introspection not socialization, detail, and systematic approaches. The degree of autonomy in most participants is great enough that building rapport and some supportive systems takes effort unlike what is usual with other groups of women. Scientists, engineers, and technologists often work independently after all.

However, in general the counseling process itself unfolds as expected and as outlined below. Initial emphasis is placed upon an opening up process which involves the examination of interests, or "I like ..." activities, and skills, or "I'm good at ..." activities. Both topics clarify vocational identity or "I am ...". Because the indirect ways of scrutinizing self are less threatening each individual takes a new thoughtful look at herself in private which results in increased awareness and appreciation. Self-esteem rises.

Then at a point in time approximately 5 weeks from the beginning, any further opening up is risky because it creates confusion, can raise anxiety, and brings on depression for some people. This sometimes illusive period is termed "the point of insignificant returns." For a large diverse group of 20 to 30 people determining the average time within a group requires familiarity with all the processes which are going on simultaneously. The instructor must provide safeguards for those who need help at this time. The course can resemble a therapy group for short periods of time. Some instructor sensitivity about how individuals suffer during this period is crucial for counseling success. This is what can be observable: decreased intellectual functioning, pained and confused facial expressions, physical signs of anxiety such as sleeplessness and loss of appetite, and reports of inability to cope with the class materials or events outside of class with the usual adaptiveness. Supportive listening without critical judgment or advice is helpful when provided by peers or professionals at this time. Providing such safeguards is both responsible and responsive.

The remainder of the course emphasizes the integration of all the new learning into a coherent whole pattern. This becomes the new vocational direction or career focus for each person. Eventual implementation is kept in view as most classroom activities center around the immediate future and "how to" activities such as interviewing resource people and devising a written Plan of Action with short-term objectives and long-term goals.

Instructional Rationale and Sequence:

One and one-half hour time periods were attempted with a full half-hour social break scheduled between the early and later sessions each day. Therefore, each set of 2 sessions was comprised of 3½ contact hours and 3 planning and conferencing hours. Test scoring, reviewing written work, briefing workshop instructors and guest speakers, and student

Offering the Project Course (Continued)

conferences competed for time and attention. Both Summer and Fall classes met twice a week: Summer in the morning and Fall in the evening. The course could also fit into either a mid-day or an afternoon schedule. It would also be possible to extend or intensify the course by altering how many times per week it met. Different major components could be rearranged to accommodate different situations or schedules. The following is the Schedule of Activities.

Date	Time (Early Session, 1½ hours long)	Time (Late Session, 1½ hours long)
1	Registration, Introductions	Course Explanation
2	Introductory Career Decision Making	Communications #1, Listening
3	Anxiety Reduction #1, Introduction	" #2, Speaking
4	Introductory Goal Setting	" #3, Self-evaluating
5	Anxiety Reduction #2, Coping	Mathematics Workshop, History
6	Strong-Campbell Interest Inventory	" " Practice
7	Anxiety Reduction #3, Awareness	" " Applications
8	Individual Preferences	Sciences Workshop, Principles
9	Accomplishments-Achievements	" " Roles and Careers
10	Decision Making Styles & Stages	" " Lab Experiences
11	Skills Identification #1, Sharing	Computer Workshop, Introduction
12	Complaints, Obstacles, Constraints	" " Hands On
13	Skills Identification #2, Resumes	Engineering Workshop, Background
14	Work Values, The Past & Future	" " Roles and Tasks
15	Skills Identification #3, Sharing	" " Career Choices
16	Value Sorting and Deciding	Film and Women Engineer Guests
17	Integration into some Objectives & A Goal	Guest Professional Women
18	Value Summary and Planning	Guest " "
19	Communications #4, Interviewing	Guest " "
20	Plan of Action Review	Plan of Action Review, Evaluation

In order to confirm that the women are moving smoothly along in the counseling process when there are so many individuals to be simultaneously monitoring requires that dates be set for the completion of the core tasks. Therefore, the commitment to a particular Holland code is due the fourth week. The written summaries of the individual preferences measured by the

Offering the Project Course (Continued)

PRF and FIRO-B tests are due in the sixth week, the summary of skills or resume is due the eighth week, and the Plan of Action is due the tenth week. In this way the instructor can communicate individually with all the participants by monitoring their acquisition of insight and offering encouragement. Letters responding to each "Plan" provides feedback regarding suggestions of alternative approaches by the instructor to the students which would otherwise be omitted.

The sequence chosen is a result of intuition and experience regarding the natural flow of the self-assessment process as is usual according to career and personal counseling specialists. The rationale for this particular selection rests with the instructor and is from her training and experience as both an educator and a clinician. For example, the Anxiety Reduction Workshop is spread out over three weeks in order to take advantage of a more extended time for practice which enhances the acquisition of these new skills. Additionally, the last of 4 sessions on Work Communications is placed at the end in order to take advantage of the urgency then apparent about how to do information interviewing. The Mathematics and Sciences Workshops lead off because they are so basic to the information participants need to gather in their decision-making efforts. The guest professional women are asked to visit the class at the end of the sequence because the urgency to meet some successful women in their chosen field is great by then but usually not before. It is common to hear complaints beginning to be expressed by about the middle of the course and to delay the session which deals with these obstacles to career planning would probably result in some women withdrawing with the conviction that they had best return to homemaking after all. And so there is a logic to this sequence chosen which some field testing has confirmed regarding effectiveness of this decision.

Inclusion of Guest Role Models:

The idea of entering a science or technology career becomes real when it is possible to meet with women who are successfully involved in just such careers. The primary instructor is not such a specific model; however, the different leaders of the mathematic, sciences, engineering,

Offering the Project Course (Continued)

and computers workshops are more appropriate models. Generally models in the allied medical, outdoor, scientific research, design, and broad spectrum engineering fields who can convince the course participants that this effortful hope is not all fantasy doomed to be but an unfulfilled dream. Therefore, the inclusion of guest role models from at least 6, and up to 8, different occupations is crucial to the type of career commitment necessary to successfully enter a male-dominated non-traditional career as a mature woman. These role models also act as job-search information resources and occasionally act as mentors. They are the core of a referral network helpful to all the participants.

Integration of Specialized Workshops

One of the core factors which is believed to have led to the success of this project was the inclusion of several specialized workshops which were integrated into the career decision making procedures by the instructor. Five of the seven workshops were conducted by faculty from the following fields: mathematics, sciences, engineering, computers, and technological trades. The remaining two workshops, conducted by the instructor, were on anxiety reduction and work communications. The details are outlined below.

Anxiety Reduction and Work Communications:

Anxiety Reduction techniques are many and varied. The effectiveness of the technique depends upon direct intervention with both the general or specific levels of physical tension and the extent of worry or apprehension provoked. The capacity to acquire insight plays an important role. General physical health increases the likelihood of success. For this course only three sessions of progressive relaxation were offered. In each session a different focus and set of experiences were presented: 1) general definitions of anxiety and varied ways of coping with it depending upon each individual's style of expressing anxiety somatically, 2) rationale for progressive relaxation, systematic desensitization, and cognitive modification, 3) creation of hierarchies for success in coping and mastering anxiety provoking situations, 4) increasing awareness of math anxiety and avoidance (phobia), 5) demonstration and practice of anxiety reduction.

Spreading out the investigation of anxiety reduction over three weeks allows for more practice time and concomitant skill acquisition. The general introductory manner of this workshop encourages students to apply the techniques wherever they may help. In order to increase awareness of math anxiety a series of incomplete sentences are individually responded to and then discussed in dyads and in the whole group. The following are example sentences.

I gave up math when . . .
I wish I could do . . . because
I have avoided . . . since . . .

This experience results in changed self-perceptions and new insights. It also helps people be forewarned and forearmed in the future. The combination of progressive relaxation and systematic desensitization with cognitive modification provide the participants with feedback on the level and location of tension in their body as they gain knowledge about their own self-defeating thoughts. They learn about coping and mastery thoughts by practicing them.

The Work Communications Workshop emphasizes four basic topics in communication skills: 1) empathetic listening, 2) assertive speaking, 3) analysis of effective and roadblocking individual styles, and 4) practicing interviewing. These topics are each the focus of a full session. In all cases an introductory explanation is followed by practice and debriefing. Practice is expected to occur outside the classroom. The analytic exercise is preceded by a brief homework assignment which provides the basis for each person's self-assessment. Applications to work settings are mentioned which culminates in a job interview practice session.

Mathematics and Sciences:

The Mathematics Workshop begins with an introduction. The need for numbers in ancient times concludes with programming calculators in the library math lab on the third session. Lecture and discussion predominate as the content shifts from real numbers to the Pythagorean cult, from Descarte to zero, and from functions to graphs. By the second session students are doing problems, with little fear, in pairs or alone. (Two sessions of anxiety reduction training have also intentionally occurred.) Suitable introductory math can vary greatly, still provide success for all but have application in the real work world. Math has filtered women out of many type of jobs and it is crucial to tackle this potential obstacle directly and effectively at the beginning of the course.

The Sciences Workshop plays a different role. It excites, stimulates, and invites. Covering all the natural sciences is impossible but explaining science and its methods is not. Examples of lecture and discussion points can be best illustrated from the lecturer's own discipline. And so principles and concepts of discovery lead eventually to a consideration of some applications and the related careers. Interests in science are not separated into biology versus physics by any particular counseling test. So actual experience in life or in the lab becomes essential in career decision making. Actual involvement in all the labs with preplanned experiments and demonstrations allowed access to these real experiences. Some discussion of science jobs was supplemented by handouts with accompanying information on resources for finding out more.

Engineering, Technological Trades, and Computers:

The Engineering Workshop was informational in nature. Numerous handouts are available from colleges, industry, and the University. Elaboration of this information by reviewing the contents confirms exposure to the contents. Lecture material covered the History of Technology, Problems of Technology, Engineering and Technological Professions, Technologist versus Technician, Career Requirements, Languages of Technology, Branches of Engineering, Functions of Engineering, and Job Entry Requirements. Consideration of real problems engineers deal with present challenges to the class and can often be current events type of topics. Engineering as a profession will inevitably look very attractive at the Workshop conclusion.

Integration of Specialized Workshops (Continued)

The Technological Trades Workshop emphasized hands-on visits to four functioning shops which provided experience with machining, carpentry, welding, and printing. There was discussion on the entry of women into these occupations noting the barriers, problems, and benefits. Each student completed an interview of a trades worker and shared it in class during the last session. The trades did not attract the participants.

The Computer Application Workshop replaced the Trades Workshop in the second quarter. General information and the background of data processing was presented along with the relevance of computer knowledge in all the science and technology careers. Use of a terminal brought direct contact with an operating computer and excitement. Use of semi-serious guessing games demonstrated both the power and the limits of computers and created definite interest in these career fields.

The Impact of the Course

The course instructor assumed responsibility for developing and conducting the evaluation of the project. She assumed the tasks of selecting the instruments for pre- and post-testing as well as creating the evaluation design. This included locating and ordering a standardized test and obtaining permission to use two unpublished but promising tests. The former measures vocational maturity, and the latter ones measure vocational self-concept crystallization and career decision-making style and stage. The evaluative findings from this course will be included in the manuals being developed for both these to-be-published tests. A description of the evaluation procedures follows:

Broad Evaluation Intentions:

In the original proposal for this project it was asserted that the course would be able to alter vocational self-concept in a positive direction for most of the women who completed the class. It is indeed fortunate that there now are several methods for describing and measuring self-concept in a vocational sense which is a result of rather recent developments. The creation of an evaluation design which had multiple measures of the anticipated and hypothesized outcomes was preferred.

The Impact of the Course (Continued)

Although Barrett listed a variety of ways which have been suggested for assessing vocational self-perception, he omits mention of either Crites' test, the Career Maturity Inventory, and Harren's test, the Assessment of Career Decision Making (1977). These chosen outcome, or dependent, variables are believed to be closely related: 1) improved and more mature career attitude should be related to 2) a more crystallized vocational self-concept as well as with 3) advancement along a continuum of greater decidedness about an occupation. Therefore, the tests selected and the aspects of "self" they measure represent the course objectives. Limitations include the likelihood of omission regarding moderator and independent variables. The uncertainty about measuring other anticipated outcomes such as a positive change in self esteem is admitted by the author.

Selection of Evaluation Instruments:

Three tests were used, along with other more informal data, in the evaluation of the impact of the course on participants. This is a brief description:

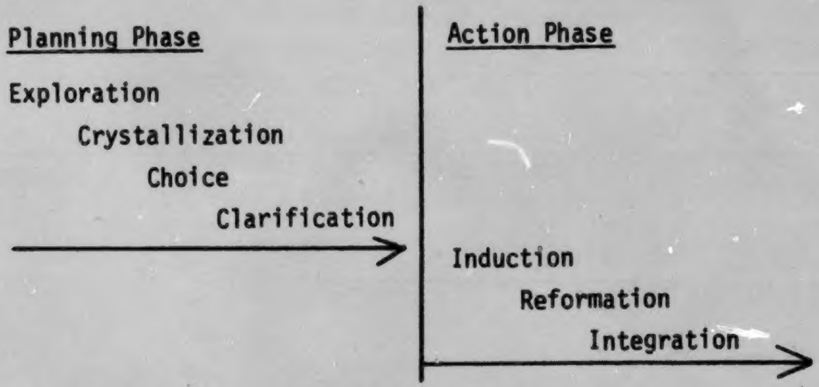
1. Assessment of Career Decision Making (ACDM) by Vincent A. Harren, University of Southern Illinois, Carbondale; unpublished and being tested and developed; released for limited use to Diane DeWitt: this test measures style of decision making using three classifications--planning, intuitive, and dependent; and it also measures states of decision making related to college, major, and occupation using the seven stages postulated by Tiedeman--exploration, crystallization, choice, clarification, induction, reformation, and integration.

2. Career Maturity Inventory (CMI) by John O. Crites, is published by CTB/McGraw-Hill, 1973: this test measures the traits postulated by Super which cluster into a general measure of career-mindedness (maturity): orientation to vocational choice, information and planning, consistency of vocational choice, crystallization of traits, and wisdom of vocational preferences. It also separately measures five career choice competencies: self-appraisal, planning, problem solving, occupational information, and goal selection.

3. Vocational Rating Scale (VRS) by Thomas C. Barrett, Delaware Valley Mental Health Foundation, Levittown; unpublished and being tested and developed; released for limited use to Diane DeWitt: this test measures overall vocational and self-concept

crystallization and global self-esteem as derived from the thinking of Erickson, Rogers, and Super.

First let us consider the ACDM, a test being developed by Harren which has historical roots in his 1964 dissertation. Following the lead provided by Tiedeman, the ACDM measures stages of decision making as they related to three new and at each occurrence discontinuous events: 1) selection and entry into post-secondary education or the entry into college, 2) selection and planning for a field of study or choice of a major, and 3) consideration of an appropriate career or occupational choice. A person will more or less move through the stages below in the direction indicated despite the fact that it is also possible to regress or become stuck. The degree of overlap is suggested by the location of the descriptive words. The individual's College Decision Making Stage is measured by questions assessing the three action phase levels. Both Major and Occupation Decision Making are measured by separately assessing the four planning phase levels.



The ACDM also measures style based upon Dinklage's study at Harvard (1969). There is data to support the assertion that this is the case regarding style of deciding.

best	planning including looking ahead
not good	intuitive or somewhat mystical
poor	dependent (including the subsets--compliant, fatalistic, impulsive, delaying, agonizing, and paralytic)

A brief evaluation of style is included in the ACDM in the form of three separate numbers between 0 and 7. Unlike the other measures this score cannot be summed into a single score for analysis and was used only as individual feedback during class, in the second case, and during the debriefing in the first case.

The second test used was a well-known test published in 1973 by Crites called the Career Maturity Inventory (CMI). The benefit of this test is the fact of its publication which gives a known reference point. The limits include the fact that it was intended for a much younger population and that most norms are of adolescents. The CMI provides 6 separate measures beginning with an Attitude Scale which measures these five dimensions: 1) involvement in the choice process, 2) orientation toward work, 3) independence in decision making, 4) preference for career choice factors, and 4) conceptions of the choice process. The sum results in an attitude score. Mean internal consistency over several age groups is .74. Both logical and empirical content validity have been found acceptable. Criterion-related validity is reported in several studies and construct validity has been extensively and successfully substantiated. The Competence Scales have five separate parts: 1) knowing yourself, 2) knowing about jobs, 3) choosing a job, 4) looking ahead, and 5) what to do now or problem solving. Each of these are scored separately. It was thought that the above attitude measures and competencies would increase over the course of the class and be at high levels when this test was used post-treatment. It was also hoped that these test results would be positively related to the other unpublished post-treatment test results and observations obtained.

The remaining test used was Barrett's Vocational Rating Scale (VRS) which measures vocational self-concept crystallization and indirectly measures global self-esteem. Two recent articles by Barrett are a result of his dissertation research which in part includes the simultaneous development of the VRS (1977). Limited investigation supports the accuracy of the VRS, reliability (r = .76), a positive relationship with general self-esteem, and a positive relationship with self-reported varied degrees of career commitment. Those with higher scores are more certain, more self-confident, and much more likely to be graduate students, older, have high self-esteem, or all three. One advantage of the VRS is the wide range of scores which enhances the separation of scores into subgroups for analytic and reporting purposes. It is sensitive to modest change due to treatment.

Selection of the Evaluation Sequence:

Data collection was spread over a six month period and followed a prearranged schedule. Informal data was constantly available and somewhat utilized in the interpretations found in the next chapter, Results and Accomplishments.

Summer Class (June to August 1978)

1. Before instruction and turned-in at the first class session
    - ACDM (Style and Stage of Decision Making)
2. During instruction
    - Counseling tests such as the SCII, private conversations

3a. After instruction and turned-in during the last class session
    Course Evaluation and Plan of Action

3b. After instruction and turned in at the September debriefing
    ACDM (above)
    CMI (Career Maturity: Attitude and Competencies)
    VRS (Vocational Self-Concept)
    Individual Consultation in September

Fall Class (September to December 1978)

1. Before instruction and turned in during the first class session
    - VRS (Above)
2. During instruction
    - ACDM (Feedback provided during the Decision Making lecture)
    - Counseling tests such as the SCII, private conversations
3. After instruction and turned in during the last class session
    - Course Evaluation and Plan of Action
    - VRS (above)

Selection of the Evaluation Methods:

At the time of application each woman had stated her career interests. At the conclusion statements of career direction were obtained from their written Plans and during the interviews. Both were coded so that low numbers represented indecision and high scores indicated both the extent and the nature of the career decision. This produced a rank ordering for analytic purposes. The highest score represented choosing a science and/or technology career focus and acting to implement a plan to reach that career goal. The eventual list of variables considered were these:

Independent Variables including Moderator Variables:		Dependent Variables:	
Predictor:		Outcome:	
Age	actual age	College	choice stage
Education	in years completed	Major	choice stage
Credit	successful completion	Occupational	choice stage
Code	from Holland's theory	self-concept	level
Choice	when the course began	Choice	at the end
Style	of decision making	Style	at the end
		Maturity	attitude
Treatment	overall-the course	Abilities	5 competencies

To provide thorough information a set of seven subgroups were created for analytic purposes. These consisted of All (N = 54), Summer (N = 29), Fall (N = 25), Appropriate (Science/Technology) N = 34, Inappropriate (Non-science) N = 20, Credit N = 43, and Non-credit N = 11. Many of the non-credit group remained involved throughout the course but none completed a Plan of Action. The Appropriate and Inappropriate subgroups were divided through establishing a harsh cut-off point on the rank-ordered codes with 6 being Appropriate and 5 Inappropriate which were derived from the Strong-Campbell Interest Inventory (SCII) results as follows.

Each of the students chose a Holland code from which to relate to the other test material. These codes were translated into a numerical system in order to produce a rank ordering for correlations and so forth. A higher rank reflected the assessment of the author regarding "appropriateness" for the course given the constant focus on science and technology careers. A person with business and service interests would within this system therefore have a low score (ESC = 2) and a person with some science interests would have at least a middle level score (IAS = 5) and the highest scores were obtained by the unquestionably science and technology oriented (RIA = 9). These became moderator and predictor variables.

These other counseling tests used were not coded for evaluation but remained self-assessment tools.

1. Personality Research Form E, (PRF), by Douglas N. Jackson
2. Fundamental Interpersonal Relations Orientation - Behavior (FIRO-B), by Will Schutz
3. Personal Orientation Inventory (POI), by Everett L. Shostrom

During the course of instruction this test data, available on all the women, including the Strong-Campbell Interest Inventory, the Personality Research Form - E (a measure of job related needs and preferences), the Fundamental Interpersonal Relations Inventory-Behavior (a measure of interpersonal work groups), and the Personal Orientation Inventory (a measure of self-actualization) was combined with the Plan of Action term paper, the various written summaries and private as well as public converations, and the full-hour debriefing and counseling post-treatment interview only to provide rich data to produce individual reports on the 29 students in the first quarter. Some informal conclusions and summaries can be extrapolated from the cases which definitely moves beyond what is possible with test data and data analysis alone.

Different procedures were followed during the two different times the course outcomes were evaluated: The ACDM was taken before the class began and handed in at the beginning of the first session with the first group. They were told that they would have complete information provided to them later. They were completely debriefed about their scores, the group averages and the distribution of scores, and decision making in general in September or one month after the concluding class session. At that time they also brought in a post-treatment set of tests which included the ACDM. This allowed for both individual feedback about a critical aspect of career development and a cleaner method of data collection.

Their feedback included comparisons of the stages of decidedness because they all were able to score the post-treatment ACDM just prior to their own individual session. Therefore, they had a concrete measure of the extent of their changes while being helped to interpret and apply the information. In the second offering of the course only the Occupational Stage was used. It provided direct involvement through feedback during the lecture on decision making and was not used either pre- or post-treatment. This design allowed for several checks on the instruments and the samples which was of concern because of no control group comparisons. The waiting-list group was only partly represented in the Fall class group and was not measured in June. Multiple post-treatment measures were collected. T-test comparisons between the summer and fall groups were planned. Eventual division of the classes into those who got credit and those who did not allowed for additional T-test comparisons. Those appropriate for the class in the sense of having science/technology interests could be compared with the inappropriate students. Differences over time could be examined because of the pre- and post-administration of the ACDM. A double check was possible on the students' reaction to the course and the general extent of the impact of the class. The fall class was not a replication in the sense that three activities were omitted and four were added. All else remained as identical as possible but our classroom guests varied.

Case studies on each of the 29 women who enrolled in the summer class were completed using all the available data in each case. Test scores and interview data were collapsed into narrative summary paragraphs presented in simple language. Extrapolations from this sort of data is complex but does appear to provide information unavailable in any other manner. This time consuming procedure was not followed for the additional 25 women in the fall class.

CHAPTER III: RESULTS AND ACCOMPLISHMENTS

Administrative and Institutional Issues

Recruitment of Students:

Through use of informal survey methods it has been established that about half the enrolled students found out about the class from the Highline College bulletin, about one-fourth from local newspaper articles, and the remaining one-fourth from campus contacts including students or "Careers for Women in Science & Technology" students. Additionally, about two-thirds of those who completed the course indicate that they personally know other women who want to enroll in this sort of course. Most of these women say that they know of about two or three others (1 to 10) who are interested in such careers. To extrapolate from such numbers it appears likely that 54 students who enrolled and 43 who completed the course would know about 75 potential students which, following our experience, would generate about one-half of another class. This speculation has not been substantiated in any solid fashion but would be interesting to investigate.

The methods of recruitment are believed to have directly determined the average age of the women who enrolled because it was the sort of publicity used by adults: newspapers, college continuing education publications, and peer group word-of-mouth. At least it has been determined that a significant number of adult women are interested in science and technology or into investigating these fields. It is also clear that this course attracted numerous women interested in a general career exploration experience. Many were turned toward general college or community agency offerings. Significant numbers of non-science women "got past" the casual screening methods employed. It is generally suspected that the fact the course was free increased some women's aggressiveness even though it was rather clear that they had limited interest in science and technology. In all, just around 100 inquiries about the class resulted in the acceptance of just over 60 women and 54 enrollees. The numbers include some overlaps because the initial 60 inquiries resulted in the very early creation of a waiting list for fall. Over 40 applications were turned in by the due date. Continuing recruitment would probably result in a continuous waiting list. This would be even more the case if efforts were to include outreach into the local high schools or directly into community agencies and organizations such as churches. It is believed that only the tip of the iceberg was observed.

Awareness of the College Staff:

Due directly to the involvement of the Women's Programs staff in this project, there is increased sophistication about both the problem and the alternative solutions regarding women who are interested in science and technology careers. The Women's Programs staff is in a better position to advise and refer women who inquire about resources and programs. The increased sophistication is allowing for greater efficiency and accuracy regarding referrals to instructors, counselors, program directors, students, employed resource people, and community, professional or vocational associations. Additional information regarding offerings and training programs at other institutions of higher education is also highly possible. This is consistent with and appropriate to the mission of the Women's Programs.

The results of a survey informally conducted at the end of the second presentation of the project course in December provided some interesting results. A somewhat random sample of 30 full-time and part-time faculty were polled regarding their awareness of and knowledge about the project. Various publications about the project were sent periodically to all faculty over the previous six months. A one-time only inquiry was made. In all, 60% of the 30 responded and of those 66% were aware of the project. The largest number, 59%, indicated that they heard about the project from other staff members; 50% heard about it from the informational materials in their campus mail box, and 40% read about it in the staff newspaper, a monthly publication. Exactly 28 % of the above responses are single sources of information for the responding faculty member. These figures indicate that less than a majority were at the conclusion "aware."

Administrative and Institutional Issues (Continued)

Human and Written Resources:

It is clear that there are substantial numbers of potential resource people available in the community but the identification and then the solicitation of their support and involvement is paradoxically both crucial to success but not cost effective and very time consuming. Extensive amounts of time were consumed in the effort to meet with professional women employed in science and technology which will eventually be of great value if the project continues. Use of these individuals in one class visit or by one interviewing student scarcely warrants the time it takes to find and interview them. Although resources exist even within a short commuting distance of this single campus, the variety of skills, fields, styles, interests, and levels needed as human resources demands a large set of resource people.

The 30 people now formally available to us, who were selected from the 35 interviewed during and as a part of the project, was only barebones sufficient. The most difficult part of this effort was finding and contacting technologists and technicians, nevertheless, it was possible to locate and establish clear supportive relationships with the women who have agreed to be resources for women students or for instructors and advisors of women students in science and/or technology programs! The resource women were not interested in having their names disseminated in a general or open manner, so, in order to monitor and maintain their availability through consideration of their limited time, files will be maintained only in the Women's Resource Center. A list describing each contact person by position, work environment, and special qualifications as a resource, will be included in the advising booklet to be given to all advising faculty and instructors with special interest in science and technology fields. Names will be omitted so that contact must be arranged through the confidential files. Fourteen of these resource women have spoken to the classes. Many others have been helpful to students on a one-to-one basis. Four of these women have made additional contact with the college and one of them served on the project advisory committee.

Administrative and Institutional Issues (Continued)

An advising booklet directing students to possible appropriate education in their chosen field is now being distributed to all instructors in those sorts of fields at the college. All occupational program directors, all counseling and admissions staff, and Women's Programs personnel have copies. Extra copies are in the counseling library and the college library.

The advisory committee held the concluding meeting in December and a recommendation was adopted regarding further support of the project and its objectives. The advisory committee formally requested that immediate efforts be put forth to incorporate this project's course into the college curriculum on a once a year basis. It was further recommended that it remain a 5 credit offering and that, as soon as possible, it be given a 100 course designation. This characterizes the thrust of current efforts on this campus since that meeting. Concern regarding the future of this course was a part of the report presented to the Board of Trustees regarding all non-traditional student needs that same month.

Discoveries About Instructional Procedures

Most of the discoveries outlined below are somewhat serendipitous findings common when a theorized approach to instruction is first actually attempted. However, the findings constitute important information specific to the goal of this project regarding locating, recruiting, counseling and instructing, guiding and advising mature women during career changes into non-traditional fields such as science and technology. Some communications from the participants [illegible] eventually resulted in an improved course.

Participant Reactions:

The reactions of the students to the class were gathered in an evaluation questionnaire completed during the last session. Variations between summer and fall classes accurately reflected the slightly different course materials. The questionnaire contained two parts: 1) open-ended semi-structured questions in the form of incomplete sentences, and 2) rank ordering workshops and the various career counseling activities. The summer and fall students ranked essentially the same activities and assignments in just about the same way. The following list was extracted from the open-ended questions and tells us what the participants felt they gained from the class. This is a list of responses obtained from only the summer class who were asked to "list positive changes which are a direct result of this course:"

"Much greater peace of mind--(strong plans), greater self-knowledge--increased confidence, awareness of universal dilemmas facing women."

"I've found things I'm good at; and to be more open."

"Direction in career choice, learning about resources available to me, learning about S & T jobs."

"Reinforced leanings toward engineering field. Learned it was possible to change careers in mid-life."

"Less aggressive and more assertive; change in career goal; better lines of communication with others."

"A new insight into myself, meeting new and interesting people, interesting lecturers. A feeling that I'm not alone."

"I learned that listening can be enjoyable. I discovered interests I didn't know I had. I just thoroughly enjoyed learning about the different fields."

"Enthusiasm for returning to work; reinforcement of my own goals; knowing many women are in transition."

"My Plan of Action - I will continue with school, know more about occupations in general. I have some fields of occupations that have been opened up to me."

"My own thoughts of myself were reinforced by the tests. My goals were hazy when I started this course, now they are visible. I'm feeling more confident with decisions and able to talk with husband better."

"Confident of my own set of skills. Confident the world can indeed use these skills. I've gained unbelievable insight into myself."

"Truly understand my values. More aware of what skills I have to offer. Have my interests, skills and values in better perspective."

"I have found a field of interest; I have started a learning process; I am more aware of my capabilities."

Discoveries About Instructional Procedures (Continued)

"Understanding better ways of communication; not quite so afraid of math; different courses of study to explore."

"Understanding that I have 'Math Anxiety' and why I have avoided the science areas as potential occupational choice. Incentive to changing careers by getting more schooling. Realization that other women are searching for more meaning also."

"I've made my decision. I've learned alot about myself, been given some words to use as tools in understanding the people around me."

"Skills list, usable on job market; sense of direction in job search directed part time, continued interest in computer programming."

The following participant suggestions were incorporated into the fall class: increase the number of guest speakers but decrease the amount of time each one presents, include guests in the social break so people can talk casually and individually with them, deemphasize trade careers, complete most of the anxiety reduction instruction before the math workshop begins, increase the time to review test results in class and have time for questions, retain the self-searching and self-assessment atmosphere, move up the interest testing in order to choose Holland codes as fast as possible, add some instruction and practice with computers, increase the specificity of instructions with regard to homework assignments, do not deviate from the instructional sequence, spend more time working in interest-code task groups on activities like skills identification and resume review, encourage reading the text and all recommended materials on the list and on reserve in the library. These were helpful comments.

It is also clear that the social half-hour allowing casual converation about class related issues was of great value. Written summaries for test results which are often only talked over were also helpful for the students. A request by many participants for more individual consultations with the instructor on an ongoing basis was written onto many questionnaires. Such issues as handling puzzling test results, managing a current crisis which is interfering with concentration in class, removing anxiety created by the process of career counseling, and handling the problem of lining up resource people in appropriate jobs or careers did not occur as often as was needed. It is difficult to estimate what effect this had on individual progress. It is likely that the resourceful women found ways around this problem and the dependent, shy, or depressed did not.

Discoveries About Instructional Procedures (Continued)

The details of the course evaluation are contained below from the responses of a total of 34 summer and fall participants.

	CAREER COUNSELING ACTIVITY	RANKED VALUE				
		(NONE = 1)	2	3	4	(5 = GREAT)
1.	Career Decision Model	6	4	12	11	1
2.	Understanding Yourself and Your ...	2	3	9	13	5
3.	"I" Statements ("I want...")	0	0	7	19	11
4.	Occupational Daydreams	2	3	14	8	10
5.	Strong-Campbell Interest Inventory	0	2	5	8	21
6.	Occupational Heterogeneity	6	7	11	9	1
7.	PRF Test and written summary	1	0	4	14	18
8.	FIRO-B Test and written summary	2	4	7	12	11
9.	The Quick Job Hunting Map	1	1	6	12	17
10.	Resume ideas or Skills Summary	0	3	10	11	13
11.	Required and suggested reading	2	2	3	2	8
12.	Social contact during the break	0	1	6	5	24
13.	Talking with workshop leaders or guests	0	2	1	5	8
14.	Talking with instructor individually	0	0	0	3	10
15.	Written comments on your homework	1	1	2	11	21
16.	Work Values	0	2	6	6	19
17.	Value Sorting	7	10	8	6	4
18.	Future Fantasy	3	4	10	5	14
19.	Obstacle and Constraint Analysis	5	9	5	9	7
20.	Plan of Action	0	0	2	10	24

The ranking system inevitably causes some activities to be ranked low. A couple of introductory activities were thus ranked because of the superficial nature of the event as contrasted with later activities. It is also noteworthy that the ranks for some of the sequentially last classroom activities have a much greater spread. This seems to indicate that for some participants an information overload has occurred. These activities are less valued because so much has already produced results and clarified a career direction. However, for about one-third of the women these later activities seem to aid them with critical decision making problems. There is an emphasis on value clarification and handling obstacles to career development or life-style planning during the last weeks of the course. It is as if the activities are of great value to a few and limited value to others relative to other earlier activities.

Significant Learner Variables:

One of the most important things revealed was the self-identification as a science and/or technology person by participants at the time they enrolled in the course. It is important to make clear that most career counseling groups and classes do not contain very many women with these career interests. Within the entire population of women in this country not that many women are involved in science and technology which is circularly related to an apparently self-perpetuating system requiring forceful intervention. Perhaps the name of the course communicates the content so well that from the beginning many women who enrolled in the classes had accurately "suspected" this was an appropriate career direction for them to consider. This project is the only one 1) known to attempt to locate women semi-decided about but interested in a career in a science or technology field and 2) able to provide a specific program aimed at encouraging and directly assisting them in this decision making process. Once enrolled in the course they are highly responsive to the experiences and benefit from the whole process.

Women with interests in science and technology careers are substantially different from women-in-general and they are also essentially different from general career counseling group users. Their interests set them apart. Their interests result in a very strong set of personal preferences which affects the mood of a class because it relates directly to preferred learning style. Their style is somewhat at variance with the usual style of career counseling groups which tend to be looser, more creative, and somewhat disorderly than they are comfortable with.

They prefer precision, detail, follow through and sequences, analysis, intellect over emotion, honesty and conviction, tact and reserve, stability and practicality, some social distance or isolation, introspection and independence. They are further notable when compared with women-in-general for having much less interest in helping and social service, spontaneousness, general socialness, persuading or dominating others, intuitiveness, disorder, creativity, and idealism. They are described as realistic and investigative to a high degree. They tend to be middle class in orientation, mature and bright. These differences mean that they gain less from groups designed for women-in-general and gain a great deal from groups tailored to their style and preferences. This course was tailored to fit this learning style while providing a step-by-step career decision making experience.

The course was also designed for women without college experience. Yet many women, especially the fall class, had completed a 4 year degree at some time in the past and were career changers. This subtley affected the methods and materials by allowing for a more rapid pace and the inclusion of some intellectually demanding materials, such as some of the values exercises and a more extensive decision making presentation. It is common in community college classrooms to find about one-third pacing right along, one-third having difficulty keeping up, and one-third flying and perhaps only minimally needing some formal instruction. This class was different, perhaps due to the fact that the age range was higher than is typical for a community college, with an average of 36 and with two-thirds of the women between 26 and 46. (The national and local average age is about 29 currently.) Those in this course who were lagging behind had very clear reasons to do so and could not do otherwise. None were flying ahead. At least about 85% seemed to be pacing along as a group.

The group pace may alter if the population is different in some critical and significant manner. Somehow the suspicion that a different socioeconomic background, a different educational level such as no college experiences, or an atmosphere of less vitality for whatever reason would alter the teaching experience and probably should result in modifications in instructional methods.

A number of the women in class will face depression and anxiety of serious sort requiring attention when in the crisis stage. Some bring this reaction style with them and for some it is a new experience. Nevertheless, the need to do first-line counseling is as important as the necessity of referrals to campus or community agencies. This can become a source of both emotional and intellectual drain for the instructor if not managed effectively. This course is the equivalent of a quadruple-size career counseling group with all the attendant pressures of the participants creating fatigue for the instructor. Some of the fatigue appears to be related to the demand for structured and precise assignments by participants. The nature of this expectation unique to science and technology people contrasts sharply with the simultaneous expectation for counselor-like behaviors during group activities in the classroom.

Then there are those who join this sort of class "under somewhat false pretenses." Some of them are engaging and attractive participants in the classroom and add a lot of vitality and interaction. They add more vitality than the typically more private and quiet science/technology women. These "Inappropriate" participants often compulsively desire people about them in any work setting. In some cases they show leadership behaviors; in some cases they are found influencing and controlling other people. They almost never have "loner" scores on tests, hobby interests which require solitude for long periods, or other reflective pursuits at either work or play. When they do things which can be done alone they have a predictable preference for being near a group. These individuals were labeled "Inappropriate" in the sense of non-science interests. Of those non-science participants in the summer class (N = 12) the largest subgroup (7) appear to be opportunistic people who enrolled despite the fact that their career focus was not a good match and they were told that other general counseling services were available. This seems to be related somewhat to the fact that this course was free because they were well aware of how rare that is. These women tend to be very well-informed and aware of events about them whereas many science-oriented women are sheltered and uninformed. The other subgroup of non-science participants are best described as in need of some form of therapy (4), tending to be older than 49 (3), or appearing to be slow withdrawn learners (3). Of the total of 17 over half (11) had inadequate decision making styles as indicated by the ACDM. All also had codes, using the Holland formula, which were inappropriate except 2 who were in need of general counseling and 2 who were slow to become involved. It is of interest that only 3 women in this entire group seem to have low self-esteem and those with this attribute also seem to have inadequate decision making styles. They still were able to report gains from the experience, added a lot of energy to the classroom, and need not be excluded. However, their presence does affect instruction.

Instructor and Role Model Responsibilities:

The role of the instructor in a model program is worthy of some consideration as it relates to the future of the program and course. The developer of any class has a unique relationship to it. It is impossible to determine how credible any model program is until additional people have attempted to apply the model to see if it can stand on its own merits. Simultaneously, it is clear that some basic characteristics would be positive attributes for anyone who was to undertake the responsibility for the class developed for this project. The following appeared in a Highline Community College publication in the fall of 1978 relative to program development and the dissemination of successfully developed programs.

> "For our institution and the rest of the state, we MUST continue to share successful programs and techniques. We must give support to creative and enthusiastic faculty members and we must recognize the four conditions for creating successes with special needs individuals.
>
> 1. It takes a person with TALENT to coordinate or implement a program.
> 2. This talented person must also have ENERGY and a PERSONALITY that will create a dynamic environment for making their program work.
> 3. This individual should be willing to take RISKS and make CHANGES in the normal process of the institution.
> 4. Behind this faculty person must be an ADMINISTRATOR WHO IS STRONGLY SUPPORTIVE AND ENCOURAGING. This is a necessity."
>
> Robert Beardemphl

Discoveries About Instructional Procedures (Continued)

This is a challenge clearly applicable to the "Careers for Women in Science and Technology" project. Given these general statements it is also relevant to consider some additional instructor characteristics which appear to be responsible for the successful coordination and instruction of this course. A background which allows rapport to begin in the early sessions seems to include these attributes: 1) having been a re-entry woman, 2) being neither too old nor too young for the majority to relate to, 3) allowing a modest level of self-disclosure only when and if relevant to the issues and topics at hand, 4) a clear sense of "self" and an openness to humor while presenting material to the group, 5) a clearly communicated comprehension of what it is like to be indecisive and troubled about career decision making in both an intellectual personal identification and an emotional empathy sense, and 6) being inquisitive and responsive to the material in the math, science, engineering and computer workshops. Having a clear concept of feminism and current and past activism provides a perspective which the participants appreciate. It seems as though the background of counselor-clinician is more helpful to this course than that of instructor-academician. The interactions in class and many of the specific activities are adaptions from individual career-counseling approaches used in clinical settings. The knowledge background of vocational psychology research provided intellectual basics for the instructor when preparing for presentation of the information on decision making styles, but much of what occurs relies on the techniques and style of a counselor. The specific workshops in anxiety reduction and work communications are based upon an integration of several clinical techniques from such varied sources as Rogerian therapy and Meichenbaum's directive cognitive modification technique. New developments in math anxiety such as progressive relaxation demand both counselor and instructor depth of experience.

Additional power is added to the course by the inclusion of specialist faculty who conduct workshops in the critical and basic areas of knowledge which are the foundation of science and technology careers: mathematics, sciences, engineering, and computers. The inclusion of these specialized workshops seems to be of greater importance than was originally believed! The significance of the special information about science and technology work, which is difficult if not impossible to incorporate into an ordinary career counseling experience cannot be exaggerated. In the case of careers which are non-traditional for the target population, certain specialists have played a powerful and direct role in diminishing fears caused by not knowing about science and technology fields. Genuine interest and broad background in these areas by the instructor is invaluable when displayed through role modeling during the workshops. Another contribution from the workshops was the perception of the "role model" workshop leaders towards their own chosen field which allowed participants direct access into what another person found beautiful, worthy, challenging, important, exciting, and fun regarding that sort of work. It is a highly motivating and gratifying experience. It is often difficult to get that same "feel" for a career or job in a private interview or an effective field survey of an occupation. This is due to the quality of experiences brought by the workshop leaders. The enthusiasm they brought to the classroom cannot be measured. They are models of competence, humanness and warmth, intellect, humor, dedication, and encouragement for the women. This aspect of the course can be considered justification for the claim of uniqueness. Even the most magical career counseling can in no way replace these role models. The guest professional women allow for a broader selection of equally impressive and equally valuable role models.

Degree of Course Flexibility:

One of the goals of this project was to completely test a course which would be able to transfer to other institutions of higher education in other geographic areas with different populations and challenges. In an effort to do so, the course was created with clearly identified sets of content. Thus, the workshops are tight self-contained packages with the work communications and anxiety reduction workshops still separate and identifiable despite the fact a specialist in these topics was not brought in. Nevertheless, it would be possible to use a specialist. The only loss to the course would be the decreased involve-

Discoveries About Instructional Procedures (Continued)

ment of the instructor and the attendant rapport, trust, and continuity. It is uncertain if it would make any difference for the instructor to be absent when others are instructing. If the instructor was familiar with the workshop leaders and their presentations and handouts it would be less of a problem than if all of it was unfamiliar when participants make references to it. Speculation will remain until these questions can be dealt with by investigation.

The model was intended to be manageable in the sense that the length of the sessions would be flexible. Using 1½ hour units of time allows for 4 sessions of that length per week for 10 weeks, 3 sessions a week for a 13 week semester, or stacking up 2 sessions twice each week can limit the number of trips to campus per week if that is important. It would be possible to intensify the process into 3 double sessions a week for 6 to 7 weeks. The effects or outcomes are unknown. The components are more suitable for a session which is 1½ hours long rather than 1¼ hours long. The shorter time is very intensified and all the workshop leaders and the instructor felt pressured by the shorter duration during fall quarter. It seemed to lead to over time, squeezing the time for a break, or beginning the second session late. The basic instructional sequence is intentional and does not need rearrangement. However, there is some "fluff" which could be removed and which up until now is used for catch up sessions. The only section which probably would have minimal negative effect if it were to be removed is the communications workshop. It is not clear what effect, if any, that would have. It would be worth finding out especially if the removal of those sessions would fit an academic calendar better on any campus.

Other than the timing, arrangements, instruction, and sequencing of the course the flexibility of the course also depends upon the availability of other supportive resources: the list of resource women, the advisory booklet and the workshop faculty are specific to Highline College and the South King County area. Several of the nearby colleges should also be able to use these resources, however the assistance provided is undetermined due to their recent development. It would be helpful to fully utilize them and determine the level of contribution obtained.

Discoveries About Instructional Procedures (Continued)

In summary, some modest modifications should allow a check on the adaptability and flexibility of the model. There would be no better way of confirming the general credibility of the course. There are an undeniable potentially large number of ways to reach the goal of involving more women with inclinations toward science and technology careers. This route shows promise. Only further attempts with different groups in different locations will indicate the long-range worth of this particular course. Contrasting this course with other methods should eventually be attempted.

The Multiplier Effect:

The potential for a multiplier effect from these efforts is great. One possibility is the high likelihood that women who complete the course will become referral sources. They are also more likely to recognize someone who could benefit from the course and so their referrals would possess a great deal of credibility. They are more likely to have friends or meet people with appropriate interests because people seek out others with whom they can share a mutual enthusiasm for the same activity or acquire a mutually desired skill. This could continue as long as the course is visible through mere existence. Greater effects could occur whenever the course is offered at another location. The effects would be even broader if the locations were apart but in the same population base and if the populations targeted varied in level of science and technology career goals. Another multiplier effect could result from the inclusion of more women in technological, engineering, mathematics, and science classes on campus. Others see them. Then it becomes more expected and common. Eventually, what is a foreign hostile environment becomes more welcoming and available. The stream would gradually widen until the current trickle became a small but navigable channel. The participants' daughters and neighbors' daughters would be more likely to enter these fields because of these pioneering women.

Predicting Successful Outcomes for Participants

In the beginning of this project it was hoped that a minimum of 75% of the women who completed at least the main parts of the course would 1) obtain a confirmation of their vocational direction through clarification of vocational self-concept and 2) be able to state a realistic long-range (2 to 4 year) career goal and 3) some short-range (2 to 6 months) career development objectives. Of that total, it was hoped that at least 50% of the women would be ready at the conclusion of the class to act upon entry into training or a position in the science or technology fields. The results of evaluation confirm that success was greater than hoped because results exceeded the above criteria. In addition there are also several specific factors worthy of identification and description because they are predictive of successful outcome.

Improvements in Vocational Self-Concept:

The changes which were anticipated in vocational self-concept were evaluated through administration of the ACDM before and after the summer course because it measures the extent of decidedness or the attained stage of decision making regarding college entry, choice of a major, and occupational choice. Scores are described within the context of the "stage theory" postulated by Tiedeman and O'Hara who have demonstrated both discrete stages and have been able to distinguish changes which should occur over time.

TABLE 1

Changes in the Level of Decidedness

	BEFORE		AFTER	
Tasks	$\bar{x}$	S.D.	$\bar{x}$	S.D.
College	21	3.4	24	7.0
Major	20	4.7	25	4.7
Occupation	23	3.6	25	3.5

Scores in the lower 20's range seem to indicate that broad exploration is occurring but scores in the higher 20's seem to indicate that choice and clarification are occurring. Therefore, it is relevant to evaluate

Predicting Successful Outcomes for Participants (Continued)

the extent to which participants were able to reach a higher level of decidedness.

TABLE 2

Participants' ACDM Score Distribution

Decision Tasks	Scores in Percent					
	21 or lower		22 to 25		26 or higher	
	before	after	before	after	before	after
College	48.1	15.4	40.8	73.1	11.1	11.5
Major	62.1	23.1	24.1	15.4	13.8	61.5
Occupation	30.2	23.1	49.0	26.9	20.8	50.0

Additionally, the percentage of participants who experienced gains consist of 75% in decidedness about college, 80.8% in decidedness about selection of a major, and 92.3% in choice of an occupation (with 30.8% within this amount essentially unchanged because they began with higher scores).

However, there were additional tests administered only at the conclusion of the summer course in order to compensate for the problem of testing effects. The VRS test results indicate that the level of vocational self-concept crystallization was equivalent to that of people who have made a career decision and are experiencing adequate self-esteem because the average score was 152 at the conclusion of the summer class. The 119 beginning average score for the fall class became an average score of 161 at the conclusion. The 9 point difference between the 2 classes is probably related to the fall class having repeated the same test in a short time. These results match those found by Barrett. An approximately 40 point gain would apparently be expected from career counseling treatment alone.

The other post-treatment test administered was Crite's CMI which was the only published test used and is used to measure career maturity, a construct related to vocational self-concept.

Predicting Successful Outcomes for Participants (Continued)

TABLE 3

CMI Scores After the Course

CMI Subtests	Percentile	Raw Score $\bar{x}$
Mature Career Attitude	72	41
Self Knowledge	66	16
Job Knowledge	91	19
Job Choosing	78	17
Looking Ahead	69	16
Problem Solving	90	15

These percentiles were identified with reference to a sample of high school seniors and may demonstrate the effects of general maturity (age of the group of women) more than effects from career counseling. This latter test was used in order to establish the comparability between it and the other two used.

The VRS is the fastest method of measuring vocational self-concept and it had the added advantage of being appropriately sensitive to changes due to treatment or experiences. The ACDM effectively indicated changes and had the added advantage of presenting scores within the context of a theory of career decision-making which participants report as quite helpful. The ACDM takes 3 times longer to administer and to score than the VRS. However, both the ACDM and the VRS results establish that positive changes in 1) self-esteem, 2) degree of decidedness about career and training, and 3) vocational self-concept crystallization occurred for most of the participants.

It is also possible to establish to what extent the women were active in training by fall quarter from both the interviews and the enrollment figures. Eight of the participants enrolled at Highline Community College fall quarter following the course for a total of 81 credits: 61 credits were in mathematics or science courses. This is equivalent to 5.4 FTEs. Additionally, at least 8 other students from the summer class enrolled at other local colleges: 2 at South Seattle, 1 at North Seattle, 1 at Central Seattle, 1 at Green River, 2 at local 4 year schools, and another is at an out-of-state university. Therefore, nearly 70% are in training now. One interesting note is the fact that the 7 women who did not get credit for the project course are all either working full-time (2) or enrolled in school half or full-time (5). The decision to withdraw made by 2 women occurred early in the quarter and was caused by the need to work and earn a living right then.

TABLE 4

Actions Taken Subsequent to Course Completion

Fall Quarter 1978	N
Enrolled at Highline	8
Enrolled elsewhere	8
Plan to enroll Winter Quarter	4
Working, job hunting	8
Uncertain	1
TOTAL	29

There was a substantial increase in certainty from the following additional self-reported information. It is directly supportive of the scores outlined previously as well as matching the enrollment figures listed above. All data evaluating outcomes quite consistently describes a success story.

TABLE 5

Changes in Self-Reported Career Goals

Degree of Certainty	Before		After	
	N	%	N	%
Uncertain	12	41.4	3	5.6
Non-science	1	3.4	4	7.4
Science/Technology	16	55.2	15	27.8
Non-Science - Action	0	0.0	10	18.5
Science/Tech - Action	0	0.0	22	40.7
Total	29	100.0	54	100.0

Predicting Successful Outcomes for Participants (Continued)

Therefore, at the time of the course conclusion, 68.5% of the participants had chosen a science or technology field. Immediately afterward 59.2% were active in beginning training or a job as a direct result of the course. A grand total of 94.4% had stated a long-range career goal along with some short-range career management objectives. Of the 54 who were involved in the course fully 51 were able to benefit directly and demonstrate career development behaviors. Those who were unable to benefit are described in the following section.

Limitations on Individual Levels of Success:

Individual case study information was used to extrapolate conclusions not possible from any other method. Specifically, the prediction of probable individual success or failure was made possible. Because a number of women who did not have a science and technology orientation enrolled in the class and because a number of the women who enrolled were in the midst of crisis or suffered from a disabling personal condition, it was of value to determine if either of these conditions would result in a lessened ability to benefit from the course. The latter are best characterized as in clear need of help and unable to benefit from career counseling at this time. In fact, many of the seeming "failures" were in these groups and it is of interest to determine if the general vulnerable state they were in or the inappropriateness of their interests contributed more to the "failure." However, there seems to be more evidence that failure is due to their vulnerability because all but those who did not complete the class did make a career decision. The failures did the reverse! The non-science participants who became decided tended to be less active in pursuing training or a job but were doing so passively and dependently just as test results predicted. That situation predates the class. Therefore, predicting success or failure involves consideration of factors which are informally ranked below in apparent order of importance. The ranking was the result of a data-based but clinically-derived conclusion. The inability to benefit from the course is a result of:

Predicting Successful Outcomes for Participants (Continued)

1. ineffective decision making by relying upon intuition a great deal, by depending upon others somewhat, or by deferring and delaying
2. having low self-esteem especially as a direct result of a personal crisis (unemployed, divorce)
3. being about age 50 or older
4. being inappropriate for the class in terms of low science or technology career interests
5. being so "decided" at the beginning of the class that a few weeks confirms a decision resulting in course withdrawal
6. having any combination of 2 or more of the above.

It is clear that this class did not effectively help women who were in need of extensive individual attention. That was not a part of the intent nor would it be appropriate to include. In a few cases the participant was responsive to the instructor's referral to another professional especially when the inappropriateness of career decision-making at this time of stress was made explicit. People in crisis do not have sufficient energy to allow for the efforts career management tasks require especially if the particular career being pursued is already a substantial challenge merely by being non-traditional for the person or the group being assisted.

The Effects of Age and Education:

Age was distributed in both classes in such a way that nearly equal groups of women were in their 20s, their 30s, and their 40s with just under one-third in each. The average age was 36 and two-thirds of the women were between 26 and 46. This is older than the average community college student (29). Only four were 20 and younger and four were 51 or older.

TABLE 6

Participant Age Distribution

Age	N	%	Average
20 or Younger	4	7.4	$\bar{x}$ = 35.8
21 - 30	14	25.9	
31 - 40	16	29.7	S.D. = 10.3
41 - 50	16	29.6	
51 or Older	4	7.4	

In order to determine if age had an effect upon any outcome measure statistical procedures were applied; t-tests had established that there was no significant difference in age between the summer and fall classes. All outcome measures, pre and post, were treated as dependent variables. There was no significant difference on pre-test measures when age was examined as a moderator variable using analysis of variance statistical procedure. The same was found for post-treatment measures with one exception: state of decidedness with regard to college. Age seems to have had a significant role for the middle group (26-46) who expressed being significantly more decided about college when compared to the 2 extremes in the age, the youngest and oldest groups with $P \leq .02$.

TABLE 7

The Effects of Age Upon the Stage of Decidedness About College

Source	SS	df	MSS	F
Middle - Young/Older	54.36	1	54.36	6.6042*
Low - High Decidedness	197.53	24	8.23	
Total	251.88	25		

* $p \leq .02$

Age appears to be significantly related to two variables at the .05 level. Those who got credit and those who were appropriate by having science or technology interests were more decided about college (Coll) and further along in the entry process if they were older.

Predicting Successful Outcomes for Participants (Continued)

The older students were less active and less likely to have chosen science (Ch-2) when they were inappropriate and did not get credit. The younger women were less decided about and less integrated into college, more likely to be science/technology oriented and more actively seeking training or work at the conclusion (Coll).

TABLE 8

Correlations Between Age and the Eleven Outcome Variables by Subgroup

Subgroups	Ch-2	Coll	Field	Occup	CMI-A	CMI-1	CMI-2	CMI-3	CMI-4	CMI-5	VRS
Total	-.32	.52*	-.01	.04	.14	.17	.13	.30	-.01	-.23	.19
Credit	-.35*	.50*	-.10	-.09	.21	.25	.10	.31	-.01	-.37	.20
Non-Credit	-.10	.75	.72	.76	-.45	-.52	.50	.37	-.07	.32	.20
Appropriate	-.21	.70*	.11	.01	.41	.31	.08	.32	-.02	-.29	.30
Inappropriate	-.47*	.20	-.17	.15	.26	-.25	.15	.12	-.21	-.31	.01

* $p \leq .05$

Education was distributed in such a way that nearly half of the women had completed only high school, just over one-third had some college experience, and the rest, 18.5%, had completed a four-year degree or more. The fall class had more college educated women, 7, and a slightly higher average educational level. However, t-tests established that there was no significant difference in education between summer and fall classes.

TABLE 9

Participant Education Distribution

Education	N	%	Average
High School	25	46.3	$\bar{x}$ = 13.4
Some College	19	35.3	
B.A. or More	10	18.5	S.D. = 1.9

Examining the effect of education was again through the use of ANOVA statistical procedures. There is no significant difference found on pretreatment measures but several of the outcome post-treatment measures approach the acceptable level of significant difference; one is significantly different at the $p \le .01$ level. Post-treatment variables which approach significance were three of the CMI subtests:

TABLE 10

The Effects of Education Upon Vocational Self-Concept

Source	SS	df	MS.S	F
College - High School	4065.98	1	4065.98	6.8977*
Firm - Unfirm Voca. Self-Concept	24168.07	41	589.47	
Total	28324.05	42		

* $p \le .01$

These subtests measure career attitude maturity and two specific competencies; knowing about jobs and choosing a job. Education significantly affected the outcome measured by the VRS, a test of self-concept. The more educated women had significantly higher scores. The overlap in scores between the two groups was very small: H.S. only, 132 to 158; college, 156 to 174. Some caution should be exercised when interpreting the scores of women who are both college educated and mature in years. Barrett, developer of the VRS, reports higher scores for both the older and the more educated students. The data of this study support his earlier findings with education appearing to operate as a moderator variables by raising VRS scores. Since self-esteem is indirectly measured by the VRS it seems to make sense that age and education enhance self-esteem as well as enhancing vocational self-concept.

In order to determine if a significant relationship existed between education and any outcome measure statistical analysis began with the calculation of correlations.

TABLE 11

Correlations Between Education and the Eleven Outcome Variables by Subgroups

Subgroups	CH-2	Coll	Field	Occup	CMI-A	CMI-1	CMI-2	CMI-3	CMI-4	CMI-5	VRS
Total	-.05	-.03	-.24	-.14	.39	.07	.34*	.35	.08	-.02	.32*
Credit	-.06	.19	-.32	-.21	.43*	-.00	.36	.42*	-.12	.11	.27*
Non-credit	.30	-.88*	.29	.05	.92*	-.27	.58	.67	.84*	.02	.77
Appropriate	-.12	.00	-.45*	-.46*	.49*	.39	.15	.38	-.13	-.25	.33*
Inappropriate	-.14	-.32	.06	.36	.26	-.40	.64*	.46	.55*	.38	.37

* $p \le .05$

Predicting Successful Outcomes for Participants (Continued)

The correlations reached significance with 8 different variables. Self-concept (VRS), mature career attitude (CMI-A), and knowing about and choosing a career (CMI-2, CMI-3) are positively related to more education. This holds for the total group but also applies to the Credit and Appropriate sub-groups and not the Non-credit or Inappropriate subgroups. The non-credit and inappropriate subgroups' more educated members are also more likely to be looking ahead (CMI-4). The less educated women in the appropriate group were more likely to be decided about a field of study and a career at the conclusion.

The Effects of Initial Career Choice and Interests:

Tentative choice of occupation before the course was investigated because before the class began each woman responded on the application regarding a tentative occupational goal. Over half those who enrolled were giving serious consideration to a science or technology occupation. About 40% were uncertain and only 1 individual bravely stated an active interest in a clearly non-science related occupation.

TABLE 12

Before Course Vocational Choice

Career Choice	N	%
Uncertain	12	41.4
Non-science	1	3.4
Science/Technology	16	55.2

However, the above information must be transformed in order to evaluate this variable through statistical procedures. Holland and other vocational psychologists feel that people accurately state an interest in an essentially suitable career when asked directly. However, the response is commonly very broad, as above, or very focused and stated in terms of a single occupation. Through application of the results of the SCII and other relevant information it was possible to code each participant's Vocational Choice. However, it is then more accurate to refer to this variable as Career Interests and relate the two concepts into a single analytic effort.

TABLE 13

Participant Coded Career Interests*

Interests	Code Examples	Value Assigned	N	%
Business Detail and Service	CSE	0-3	15	28.3
Borderline	IAS	5	5	9.3
Appropriate	ICS	6-7	9	16.7
Science and Technology	RIA	8-10	25	46.4

It is possible through use of the codes to determine that nearly half of both classes were strongly science and technology oriented, an additional 17% were somewhat science and technology oriented, and about 10% are best described as borderline and leaning towards science-related occupations. The remaining women, N = 15 or 28.3%, were occupationally oriented toward business or service. It would be a demanding task to separate out of the "uncertains" who are also not very science-oriented because many of these women wanted to be in an environment involved in science or technology activity such as the Federal Environmental Protection Agency or the city Engineering or Planning Departments. Some of these women were interested in writing, or managing, or researching positions in those work settings. A very small number of women were clearly and 100% interested in non-scientific occupations which are enterprising or social service such as real estate sales. Upon translating the Holland codes of each woman into rank order using the above assigned values correlations were used to determine if any relationship existed between the codes and various dependent variable measures.

The actual number of participants who were assigned as Appropriate* was 34 or 63% of the total of 54. To be included required an assigned value of 6 or higher. Those with 5 or lower numbered 20 or the remaining 37% and were regarded as Inappropriate.*

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*Values were created for analytic purposes by translating the letters of the Holland Codes thus: "R" or "I" in first or second place = 4, "R" or "I" in third place = 3, "C" = 2, "A" = 1, "S" and "E" = 0. The results matched Holland Codes to judgments of appropriate or not appropriate for the course.

Predicting Successful Outcomes for Participants (Continued)

TABLE 14

Correlations Between Coded Career Interests and Eleven Outcome Variables by Subgroup

Subgroup	Dependent Variable	Pearson's rho	$p \leq$
Summer	CMI-Attitude	.49	.009
Fall	Choice-after	.43	.02
Appropriate	VRS	.34	.03
	CMI-prob. solv.	-.55	.01
Credit	Choice-after	.34	.01
Non-Credit	CMI-Attitude	.57	.005
	VRS	-.96	.02
	CMI-know jobs	-.92	.01
	CMI-choose jobs	-.99	.01

The correlations reported above are the only ones of a total of 228 correlations completed which reached a significance level of at least $p \leq .05$. From this evidence it would seem correct to conclude that the more science and technology the individual's interest code (that is, high in Investigative or Realistic interests) the more likely career attitudes will become mature (CMI) and the more likely the person will be actively training for a science-related career (Choice-after). Having a more formulated vocational self-concept (VRS) along with a less clear idea of what to do next (CMI-prob. solv.) seems related to science and technology interests. Those who got credit for the course are likely to actively implement their career plan by enrolling in training or finding a job. Those who were science and technology oriented but did not get credit seem to have mature career attitudes yet they simultaneously have low vocational self-concept crystallization, do not know about jobs or how to obtain them.

Differences Found Between the Two Classes:

Using the t-test statistic to make comparisons between the two classes revealed no significant differences between the summer class (N = 29) and the fall class (N = 25), in age, educational level, choice

Predicting Successful Outcomes for Participants (Continued)

of occupation before the class, choice of occupation after the class, Holland coded interests, or the post-treatment measure of vocational self-concept crystallization or general self-esteem (VRS). This is readily interpreted to mean that the class attracted very similar groups of women despite the different meeting time and the differences of the season. The morning summer group was not significantly different from the evening fall group on any variable measured.

It furthermore seems reasonable to conclude that the effect of having taken the VRS before the class, as the fall group did, was not detrimental. The post-treatment scores were not significantly different from those in the summer class who only took the test at the conclusion. The VRS can perhaps be used repeatedly without a great deal of test taking practice marring the accuracy and interpretation.

Comparisons were completed using the subgroups termed Appropriate (N = 34) and Inappropriate (N = 20). T-test results indicate no significant difference between these groups on education; choice of occupation before the class; stage of decidedness with regard to college, field of study, or occupation either before or after the class; all five post-treatment measures of maturity of career development competencies, and vocational self-concept crystallization or general self-esteem also measured after the class. This would indicate that both the Appropriate and Inappropriate women in both classes have a great deal in common and that a nearly identical level of "help" was obtained from the experience. On two other variables significant differences were found. First, the post-treatment measure of career-development-related action interacting with the nature of choice (science/technology as contrasted with non-science) at the end of the experience was significantly different ($F = 1.39$, t Value = 2.43, df 48, $p \leq .05$). The science/technology women were much more actively planning their careers. Second, the post-treatment measure of career attitude maturity (CMI-A) was significantly different ($F = 2.25$, t Value = 2.02, df 21, $p \leq .05$) because the Appropriate group had the more mature scores. And the Appropriate group was more likely to be actively involved in training *if* the career focus chosen was science and technology.

Predicting Successful Outcomes for Participants (Continued)

When comparing the subgroup which got credit for the class (N = 43) with those who did not get credit (N = 11), t-test results show no significant differences on education, choice of occupation before the class, stage of decidedness with regard to college or field of study before the class or after, stage of decidedness with regard to occupation after the class, or on any of the other 7 post-treatment measures of career maturity, competency, or self-concept. However, there was a significant difference found between the credit and non-credit groups on 1) choice of occupation and level of action aimed at reaching a career goal after the class (F = 1.59, t Value = 3.01, df 49, $p \leq .05$) and 2) on the stage of decidedness with regard to occupation before the class began (F = 1.08, t Value = .87, df 51, $p \leq .05$). This seems to indicate that those who got credit for the class are less decided about an occupation, or are at a lower level of decidedness, when class began. But they also were more likely to be interested in science/technology careers and be involved in career training at the end of the class. The non-credit group is best characterized as having their minds more made up but being less active in the pursuit of their goals. Decided but passive.

CHAPTER IV: CONCLUSIONS AND RECOMMENDATIONS

Speculations Regarding the Extent of the Need

There appears to be sufficient interest among the mature women of South King County to justify continuing these efforts because it required little effort to locate and enroll sufficient numbers of participants for 2 classes. It is safe to assume that areas with similar demographic patterns should also contain mature women interested in this sort of help. Suitable publicity efforts would be a necessary preliminary step, not necessarily follow identical procedures as outlined here, but in line with the above assumption. It should be important to determine the effect of no tuition on the course participants including how it relates to non-science women who enroll.

Despite having considerable numbers of women involved who were not science and technology oriented, the 75% career-decision goals was exceeded (94.4%) and the goal of 50% selecting a science and technology career was also exceeded (68.5%). The author is convinced that there is a broad, undiscovered, and unlocated group of women who should reroute their careers into paths more suitable to their interests and skills by entering a science or technology field. This report recommends that these efforts continue in order to both meet the needs of this target group and to establish just how extensive the needs are. Confidence in the ability to help these women is justified on the basis of these results such that the course is close to being "a success guaranteed" situation.

Continuing to Offer the Course at Highline

There is a clear obligation to provide backup supportive services to those who have completed the course and as a result are currently enrolled in technological or scientific training at Highline. They need access to both continued encouragement and concrete assistance. The former may consist of sympathetic listening. The latter may be some need to work out a work-study placement or find a part-time job.

It should be beneficial and supportive to continue to increase the awareness of the Hignline faculty regarding the needs of this particular group of re-entry women. Counselors should be briefed. They will be

Continuing to Offer the Course at Highline (Continued)

finding referrals for future courses and occasionally providing some follow up career-management decision-making assistance. In some cases they should be helping with math anxiety or general crises. A post-treatment support group could even meet with a counselor weekly in the following quarter. This might help retain positive gains obtained from the course, reinforce goal-directed behaviors, and intervene in obstacles and problems threatening to derail the course completers.

It is necessary to actively maintain the human resource professional women communication channels as a source of job referrals and to assist in occupational field surveys. A network should be developed to facilitate contacts between women with similar interests and career goals. The college faculty is not as aware as was hoped. The Advising Booklet might be instrumental in increasing some information for them about the reality of science and technology training and job opportunities. The effects of the Booklet will be assessed in eary 1980. If it has been a helpful advising tool a 1980 edition will reflect any changes.

Given the current methods of channeling funds and assigning teaching staff within Highline, it would be difficult to integrate the course of the project into the usual course offerings of the college. Part of the struggle is that the different academic units of the college would produce a confusing administrative problem, both a personnel and fiscal issue.

Assigning different responsibilities to different components of the college would result in fragmentation of a course that is currently whole, consistent, and integrated. Finding a simple home for the course seems impossible within the usual structure of a community college except in an innovative-outreach type of department because it is neither a counseling or psychology offering nor is it science of technology either. The course is integrated vocational psychology, career counseling, mathematics and the scientific disciplines, plus the applied fields of computers and engineering. It requires extraordinary efforts and extraordinary funding to provide this particular sex-equity in education and employment offering at any college, including Highline. Because of this, the course has not been available at Highline since the 2 quarters in 1978 when it was developed and tested. The author recommends that it be available again soon.

Enlarging Efforts by Transferring the Course

The easiest way to transfer this course would be for the course developer and instructor to assume responsibility for coordination and instruction on another campus through the sponsorship of a campus administrator such as a Women's Programs Coordinator. This could result in a replication of the course as it is, that is, as a special offering set up outside the usual departmental structure of the college with separate funding. This procedure simplifies administration and communication by allowing considerable freedom to conduct faculty briefings, publicity, preenrollment advising, and setting up instructional arrangements. Follow-up contact with on-campus faculty is for the course participants after the specialized motivational workshops because their need to confirm a goal is genuine. This method of course transference requires that the instructor be geographically mobile and available.

Although it is clear that 1½ hour segments of instruction are most appropriate, it is likewise clear that the sequence of topics should not be significantly changed. Other than being a commonly accepted sequence it is also based upon logic with regard to decision-making about a career change. The intensity of more than 6 instructional hours weekly would most likely only be effective with a group containing nobody "likely to fail" as was previously described. It is likely that a lessened intensity, 3 or 4½ hours weekly, would be effective if the procedure did not extend beyond 14 weeks. There is some urgency to get-on-with-it for most participants and this time limit is probably the acceptable outer parameter.

It is highly likely that the only group with which it would be appropriate to change the pace to a faster rate would be, at a minimum, college educated, above average in intellectual capacity, and not dealing with any stressful situations at the time.

The leaders of the various workshops should be from each of the campuses on which the course is offered. Exceptions would be from any lack of a woman on the staff. Complete briefing by the instructor should occur for each new person to handle concerns about proper content and what the participants are like. Freedom to develop materials need to be left to each workshop leader so she uses material she is comfortable with.

Enlarging the Efforts by Transferring the Course (Continued)

Logistical limitations might alter the offerings at some colleges in which computer technology is not developed or science labs are unavailable. Efforts should be made by the instructor and particular faculty member to compensate for these limitations. Publicity needs to be set up to reach each college's faculty as well as to attract participants in this new location.

Although any college could offer this course in many different pieces by having career counseling classes, introductory science and technology classes, specialized math anxiety groups, and an assortment of different vocational sampler mini-courses, it probably would require start-up special funding and ongoing administrative monitoring. The many different components would only be sought out and used by a few and the likelihood of being seen as a unit or package is low. It is a less cost-effective approach in the long run.

A more effective utilization of the Women's Program coordinators would be to provide institutional support in the manner outlined in this report for a completely integrated sex-equity in education and employment offering such as "Careers for Women in Science and Technology" or its equivalent. The coordination of many separate units in many separate jurisdictions on a campus would be too likely to cost more, achieve less, and frustrate many while serving few.

It is possible that at a regional or state level that on-site training should provide the general information and assistance which is critical to initiating this sort of effort in a broad-based manner. Some provision for follow-up consultation would be necessary after the duplicate effort had begun. A systematic effort to transfer the course should result in a multiplication of the numbers of women assisted into non-traditional science and technological careers in our state and allow Washington to become the leader in this field.

Obtaining Financial Support

Because the number of faculty and guests are in addition to the usual costs of offering a course the personnel cost is high. No tuition fees plus the large volume of materials used in this and other career counseling courses creates a relatively expensive class to offer. The need for outside-the-class support from the college and community adds to the overhead. The extensive use of instructor office hours is an added cost. Yet, it would be highly consistent with the acceptance of the idea of a societal obligation to assist women who were side-tracked in the past from a career in science of technology. This suggests that there be efforts made to continue to offer the course free or for nominal costs to participants. "Free" will attract inappropriate participants in greater numbers and will also diminish the level of commitment in general because the financial investment is so small. It is probably wisest to assume a middle posture, charge for materials or administrative overhead, and to avoid tuition fees in cases where there will be no credit option. When there is a credit option different arrangements will need to be made. College credit does not attract the participants. Most of the course participants were not enrolled for any other college courses at the time because they were potential re-entry or first-time-entry college students.

All indications are that this course should remain funded and operate outside the usual academic structure to be effective because it is completely interdisciplinary and costly in unusual but understandable ways. Therefore, special funding procedures and sources sought and managed with a minimum of confusion should facilitate the availability of the course. Costs begin to explain the lack of such a course and effort.

There are good funding-related reasons to confirm the impact of the course on the past participants through means of a follow-up study. This study can be conducted by a mail-out survey followed with telephone interviews to the non-responders. Just how much the course achieved in the way of providing a beginning foothold for a science and technology career changer would permit more careful definitions of project results. This should also assist in justifying the request for funds for continuation of the project and course. These follow-up investigations should begin immediately. There should be a repeat of the course no later than 1980 at Highline Community College to determine if the first response was

Obtaining Financial Support (Continued)

a unique event or a display of an ongoing community need. The course should also be offered at at least 3 other nearby colleges in the next 18 months.

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HIGHLINE COMMUNITY COLLEGE RESOURCES

I. COUNSELING CENTER

1. Barron's Profile of American Colleges, Organized by majors and colleges.
2. Computer terminal: Washington Occupational Information System (W.O.I.S.) (Please make an appointment)
3. Concise Handbook of Occupations, Quick one page descriptions.
4. Dictionary of Occupational Titles (DOT), 3rd edition, Vol. I & II Descriptions of 22,000 jobs; worker traits "required" for 500 jobs
5. Encyclopedia of Careers & Vocational Guidance, Vol. I & II
6. National Trade & Professional Assns. of the U.S. & Canada and Labor Unions, Source of ideas for more career information and contact people
7. Occupational Outlook Handbook, Detailed descriptions of future expectations.
8. Occupational Thesaurus: Handbook for Jobs in College Majors, Vol. I & II. Lists majors with related careers.
9. SRA Handbook of Job Facts, a quick overview of some careers.
10. Vertical Files: Various job descriptions.

II. LIBRARY

A. Periodicals Section
   Various Professional & Technical Journals
   Worklife Magazine
   Working Woman Magazine

B. Reserve desk (to the left of the entrance)
   1. A.C.T. - "Careers for Women in Science & Technology"
   2. Kreinberg - "I'm Madly in Love with Electricity"
   3. Remick & Miller - "Mathematics Participation ..." a local research project report
   4. Stent - "Can Math Anxiety Be Conquered?"

III. PLACEMENT CENTER

Pamphlets, job listings, and full-services

IV. FACULTY

APPENDIX A

PUBLICITY

PUBLICITY MATERIALS INDEX

1. Project brochure for Summer class.
2. Project brochure for Fall class.
3. Continuing Education Bulletin for Summer class.
4. Continuing Education Bulletin for Fall class.
5. Newspaper clippings related to Summer and Fall classes.
6. Announcement of Summer class and project in Women's Programs Newsletter, March 1978.
7. Announcement of project in Women's Week, University of Washington, Office of Affirmative Action for Women, May 24, 1978.
8. Press release on Fall class from Highline College Office of Public Information.
9. Letter to Faculty and Staff at Highline, May 24, 1978.
10. Summary of literature explaining need for the project, distributed to faculty and staff with cover letter and brochure on May 24, 1978.
11. Article on project in College Log, Highline's Employee newsletter, September 18, 1978.
12. Request for information from a faculty sample.
13. Letter to applicants selected for Summer class.
14. Letter to applicants selected for Fall class.
15. Summary of Report by Women's Programs Coordinator to Highline College Board of Trustees, December 14, 1978.
16. Summary of plan developed at Arizona conference on nontraditional careers.

APPENDIX B

ADVISING

LIST OF CONTENTS OF THE ADVISORY BOOKLET

I. How to use this book
   A. "How to use this book"
   B. Index
   C. Table of contents

II. Science and Technology at Highline Community College
   A. Occupational Programs in Science and Technology
   B. Occupational Program Sheets in Science/Technology related fields
   C. Courses in Science, Mathematics, and Technology offered at Highline

III. Occupational Programs in Science and Technology at other Community Colleges in King County
   A. Bellevue Community College
   B. Green River Community College
   C. North Seattle Community College
   D. Seattle Central Community College
   E. Shoreline Community College
   F. South Seattle Community College

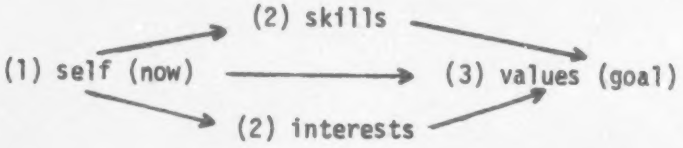
IV. Occupational Programs in Science and Technology at Vocational-Technical Institutes in King County
   A. Lake Washington Vocational-Technical Institute
   B. Renton Vocational-Technical Institute

V. A list of disciplines in Science and Technology at the University of Washington
   A. School of Architecture and Urban Planning
   B. College of Arts and Sciences
   C. School of Business Administration
   D. School of Dentistry
   E. College of Education
   F. College of Engineering
   G. College of Fisheries
   H. College of Forest Resources
   I. Interschool or Intercollege Programs
   J. School of Medicine
   K. School of Nursing
   L. School of Pharmacy
   M. School of Public Health and Community Medicine
   N. Reserve Officer Training Programs

APPENDIX C

INSTRUCTION

INSTRUCTION: CAREER COUNSELING DESCRIPTION OF PROCEDURES

Name	Methods	Materials
Registration, Introduction	Welcome prospective students then conduct the registration procedures. Class instructor next introduces herself with a description of her vocational background with this specific course and project. Have individual students take turns explaining why they came to the class and what they hope to gain from it: mention of vocational background is specifically encouraged. Summarize all introductions while maintaining a positive outlook about their hopes! Use examples	Registration forms, parking permits, applications for credit
Course Explanation	Conduct a discussion which allows time for many questions and the expression of concerns. Clearly identify the course's emphasis in order to help people decide if they should remain. Review the list of requirements and the schedule. Readings are to be verbally annotated. Explain the career counseling process in broad terms and the content of the course. Homework: Strong-Campbell, "I statements," and "Understanding your..."	Syllabus and Schedule of Activities, Career Identity Bibliography and Strong-Campbell Interest Inventory and other homework assignment sheets
Career Decision-Making Elements	Collect SCII, check attendance, answer questions and debrief. Pass out class roster. Lecture on the use of the completed sentences: examination of consistencies and gaps in the lists to locate areas which need greater individual attention: (1) identity, (2) method, and (3) goal. Provide help with renaming and with organizing the lists into a simulation of career decision-making and development:  (2) skills (1) self (now) (3) values (goal) (2) interests	Incomplete Sentences and Career Decision-Making Process Model. An incomplete sentence exercise using three stem phrases: "I am...," "I like...," I'm good at...," and "I want...". People naively project very useful aspects of themselves when they write 10 to 20 completed sentences. This is also used for a demonstration of the process of career counseling and decision making. Abstract and concrete examples will become consistent and related. Introductory.

Name	Methods	Materials
Career Identity	Dyads continue the examination process by providing a sounding board for their partner. Later add the incorporation of the opinions informally obtained from two friends. Continue examination in dyads. Briefly check in with each pair of students and respond to requests for assistance. Obtain and discuss volunteered sharing and some generalizations. Homework: PRF and FIRO-B, Text	"Understanding Your Career and Your Self." This is an adaption from a recent Holland-inspired pamphlet which is rather sexist. The exercise consists of asking at least 2 people whose opinions are trusted to assign a Holland-style code to the person--based upon brief descriptions provided on the sheet. It provides a contrast with self-perception. It is introductory and seldom threatening.
Understanding Occupations	Collect tests. Complete "Daydreams" in class. Use the "Job Finder" to code results. Using a group counseling process solicit some sharing the results. Draw out individual people until overlapping themes emerge. Group clarifies the similarities or discrepancies. Integrate previous material into any conclusions. Continue discussions in dyads, then foursomes. Specific focus for groups structured by suggestion. Hold a general summary and questions conclusion. Homework: ACDM (Form B), Holland Types handout for interpretation of the SCII.	Self-Directed-Search, page 1; and Occupations Finder pamphlet--another sexist article from which these elements are still usefully extracted if clear limits are set regarding appropriate levels of reliance on these materials.
Vocational Interests	Conduct a large group lecture and discussion by providing background and then systematically demonstrate SCII interpretation. Define test limitations, strengths, and value. The intensity will rise. Clarify by repeating information. Reminder that a tentative choice of summary code is due in one week for Skills Identification. Homework: PRF and FIRO-B Interpretation materials, all questions on SCII written down and brought in.	Strong-Campbell Interest Inventory. This test is used world-wide to measure interests and interest patterns. 1977 Revision and Multipage output preferred.

Name	Methods	Materials
Work Preferences	Handle questions on the SCII. Check homework progress. Conduct a large group interpretation session. Demonstrate balancing and combinations of preferences. Stress the interpretive meaning of Standardized "T-scores" using I.Q. formula. Apply results to different occupations people are interested in: solicit individual questions and examples.	PRF - Form E. This is a standardized test used to measure individual preferences for counseling purposes. It contains no threatening classifications, has a recently measured norm group, and is relevant for career counseling. It helps clear up issues raised by the SCII.
Accomplishments	Handle questions on the PRF and FIRO-B. Check homework progress. Present the role of skills in career maturity, job satisfaction, motivated job searches, and self-esteem. Conduct a process: Write down and then share with a dyad partner one early achievement. Repeat with a very recent one. Complete a list of at least 10 more but not over 20 more. Complete any elaboration in margin notes to self. Discuss these with partner until a few (5 to 7) emerge as most valued or most fun or both. Pick ones that are easy to feel proud about and which have promise of future application. Sleep on the choices. Confirm all those completed the exercise.	This is a group counseling experience which combines some of the techniques of Haldane with Holland's theory. The activity concludes with a list of between 12 and 22 achievements which are prioritized according to their future value or promise in continuing to identify skills. It is a motivating activity and creates much good will.

Name	Methods	Materials
Skills Identification	Create groups of 4 or 5 through application of Holland summary codes selected by each individual. Pass out task group sheet. Provide a brief demonstration of this activity in a fishbowl exercise. Have task groups meet twice and on each occasion work on the same things: Taking turns, each person describes fully what she did to achieve the previously selected set of 5 to 7 accomplishments then task group members listen and write skills lists. Each listener will also use "Maps" to add more skills by assigning parts to listeners by the speaking participant and be based upon her chosen code...then the skills lists are shared within the task group. Give each person at least 30 minutes attention. Have people fill out up to 3 "Maps" sections in pencil coded according to most preferred skills as well as the 4 skills lists from peers. In the concluding time of the second round, demonstrate resumes for 20-30 minutes. Homework: Maps Skills Summary Paragraphs	The Quick Job Finding Map by Bolles is used as an idea source for skills extraction (homework), elaboration (in class small groups), and summary. The advanced original version must be used because it is consistent with the use of the Occupational Themes and speeds up the process by keeping to these familiar classifications. A brochure by the Washington State Employment Security Department provides examples of basic forms for resumes. Supplemental ideas may be obtained from printers, books, and student work. Individuality is emphasized and the generation of new methods is encouraged.
Interpersonal Styles	Conduct a large group interpretation session. Handle questions. Form into informal groups of four or so and place sets of scores from groups on the board for examination keeping in mind that this is a simulation of a work unit ... a people environment. Address issues which arise. Homework: Paragraph summary using the Holland code as a starting point and read example summaries.	FIRO-B. This is a test which is used in counseling individuals in groups such as work units by testing interpersonal relations preferences. It assists in selecting people environments within a career or can help identify appropriate career choices.

Name	Methods	Materials
Decision Making	Collect PRF and FIRO-B Summaries. A lecture presents ideas relevant to those attempting to make better decisions. Relying on the recent work of several the concepts have general application but related closely to career choice. The theories of Tiedeman, Super, Erickson, and Rogers combine in different ways in Harren and Barrett's work. Johnson's findings are presented. Often a very enlightening experience. Basic concepts should cover effective styles and states. ACDM. Each individual has their score to refer to. Johnson's promising descriptions and the examples he provides help. Questions and a "challenge" summary. Homework: Work Values	Harren's test (ACDM) of Career Decision Making which measures state and style of deciding. Currently being field tested. See List of Counseling and Evaluation Instruments. Barrett's test (VRS) of Career Self-Concept Crystallization which measures level of decidedness as well as global self esteem. Currently being field tested. See List of Counseling and Evaluation Instruments. Both of these tests' results may be shared with people in order to give insight and a point of reference from which to react to other decision making information such as the lecture described above.
Career Obstacles	Conduct a large group counseling experience by discussing impasse and how common it is. Have all respond in writing to the handouts by filling in the blanks provided or on notebook paper. Share. Both dyad sharing and large group work but each has a different outcome. Select method according to desired outcome. Provide a demonstration on how to cope with barriers. Have dyads or foursome try. Conduct a large group brainstorm and conclusion. Homework: complete exercise at home for the Plan.	Complaints and Barriers and Goals. This is an activity useful in a large or small group which uses career counseling techniques to confront false barriers. Peers help see the flaws in reasoning. Provides help for some people who bog down at this spot. This is an adaption from Loughary and Ripley's work. Identifies goals. Reaches some. Constraint Analysis. Another activity adapted from Loughary and Ripley which essentially accomplishes the same as complaints but provides a much more systematic method for turning obstacles into value related objectives. A morale lifter and it reaches a majority.

Name	Methods	Materials
Identifying Work Values	Collect Maps and Skills Summaries. Present the role of values in life planning and goal setting. Examine the results of the Work Values exercise. Solicit involvement. Go over the Plan of Action step-by-step then. Demonstrate an individual consultation. Have dyads and triads continue. Encourage integration of previous value materials such as the "I want ..." lists.	This is an exercise which attempts to provide a classification system for work values which is often a helpful clarification. Figler's "test" loosely measures and then ranks. Usually this provides a reinforcement for the career direction already emerging when it is used late in the process such as in this case.
Future and Goal Setting	Using systematic relaxation to obtain a receptive state, create a structured fantasy (Friday, late afternoon, 3 or so years in the future). Debrief. Summarize experiences as they relate to hopes, goals and short-range objectives. Homework: Complete cards for Values Sorting.	Future Fantasy is a counselor-led experience which counts on the imagination of the participants and a high level of relaxation appropriate for attempting to touch on preconscious information in the form of unfulfilled hopes and wishes. This experience encourages a look into the near future to plan a set of objectives which fit the goal situation visualized.
Value Sorting	Individuals will use recipe-size cards prepared as homework. Instruct each person to step-by-step list constructs which describe 2 of the 3 sorted cards on each sort. Complete about 20 sorts. List contrasts opposite the constructs. Record feelings about the constructs and contrasts. Conduct a demonstration of clustering and extracting goals and objectives. Let each try for themselves. Manage questions and problems. Counsel patience. Provide optional "value sorts" which can be completed at home.	Value Sort Instructions and Examples. A set of activities adapted from techniques developed by Forster. Emphasis in class is upon sorting out people environments but other topics are selected for private and at home investigation from these choices: people, jobs, living settings, private time, activities, accomplishments and activities. Kelly's theory is the source.

Name	Methods	Materials
Dreamscript	Present a long-range planning minilecture and discussion to help people juggle wishes and hopes with the reality of barriers. How to go about confirming the reality of dreams by doing some reading and interviewing. Sharing successes spontaneously. Draw out any who want assistance and manage it in class.	Planning Worksheet. An activity which can be developed from a variety of materials but most commonly from values clarification activities. It is a long range goal setting activity which emphasizes the idea.
Plan of Action	Summary activities provide an example of how to reconfirm conclusions by going back and checking source materials such as test results or homework. Emphasize what needs to be done in the near future if the more distant goals are to remain in focus. Encourage suggestions from everybody. Each individual should be the sole focus of attention for at least 5 minutes.	Plan of Action Instructions. A systematic four step process which produced a set of objectives attached to a general goal. The activity is completed in private. This assignment integrates the information and insights obtained from many or most of the listed materials and experiences. Having a Plan "B" is a part of The Plan. This creates a sense of commitment-to-action in the individual.

APPENDIX D

MATERIALS

V. SCIENCES WORKSHOP

35. Biological Sciences Program (Highline College)
36. Washington State Employment Projections to 1985
37. Washington State Job Opportunities Forecast, Third Edition

VI. ENGINEERING WORKSHOP

38. Manufacturing Engineering Technician (Highline College)
39. Engineering Transfer Program (Highline College)
40. Drafting (Highline College)
41. Construction Management Technology Program (Highline College)
42. University of Washington Admissions Information

VII. COMPUTERS AND TRADES WORKSHOPS

43. Computerms (University of Washington)
44. Technological Trade Worker Interview

The required text for the course was chosen within three days of its July release: Bolles - The Three Boxes of Life. Participants also purchased the J. L. Holland - Occupations Finder pamphlet and the Advanced Version Quick Job Hunting Map - R.N. Bolles. Eight other basic books were on reserve from the instructor's collection.

The following materials were used and rejected as a future part of this course:

45.	Personal Orientation Inventory - Shostrom	This test of self-actualization or human mental health is based upon the ideas of Maslow and colleagues. The test provided a painful and counter-productive jolt to many and it seemed to interfere with self-esteem in many instances.
46.	Lifestyle Analysis - Loughary & Ripley	An application of Maslow's hierarchy to life planning was dropped because of lack of time and the limited help it appeared to provide.

INSTRUCTIONAL MATERIALS INDEX

I. CAREER COUNSELING

1. Course Outlines and Schedules of Activities (Summer and Autumn)
2. Suggested Readings and Resource Lists
3. Career Decision Making Process Model
4. Understanding Yourself and Your Career (Holland)
5. Occupational Daydreams (Holland)
6. Holland Occupational Themes
7. Class List with Holland Groupings (Autumn)
8. Interest Pattern Distribution Example Sheet
9. "Where There's a Quill There's a Way (Washington Employment Security)
10. P.R.F. Scales Interpretation (Jackson)
11. F.I.R.O.-B. Interpersonal Awareness Interpretation (Schutz)
12. "Reducing Fear of Failure" (Counseling Center, Highline College)
13. Lifestyle Description Exercise (Forster)
14. Some Complaints I have (Loughary and Ripley)
15. Constraint Analysis (Loughary and Ripley)
16. Values in the World of Work (Figler)
17. A Values Sort to Clarify Other Aspects of Your Life (Forster)
18. Instructions for a Plan of Action
19. Course Evaluation (Summer and Autumn)

II. ANXIETY REDUCTION WORKSHOP

20. Suggested Readings
21. "Grade Panic" (Counseling Center, Highline College)
22. "What To Do About Your First Low Grade" (Counseling Center, HCC)
23. "Why Take More Math?" (Affirmative Action Office, U. of Wash.)
24. "Can Math Anxiety be Conquered?" (A. Stent)
25. "Participation Rates in H. S. Mathematics and Science Courses" (H. Remick and K. Miller)

III. WORK COMMUNICATIONS WORKSHOP

26. Suggested Readings
27. "Listening to People" (Counseling Center, Highline College)
28. Definitions (Lange and Jacobowski)
29. Components of Three Different Communication Behaviors (Lange and Jacobowski)
30. Assertive Statements (Richie)
31. Identifying Your Communication Style
32. Roadblocks to Effective Communication (T. Gordon)
33. Interview Tips

IV. MATHEMATICS WORKSHOP

34. Introduction to Graphing, I, II, III

APPENDIX F

CASE STUDY REPORTS*

*THE CASE STUDIES WERE USED FOR PLANNING AND EVALUATION PURPOSES BY THE PROJECT STAFF. THEY ARE NOT INCLUDED IN THE FINAL REPORT TO PROTECT THE PRIVACY OF PERSONS INVOLVED. INQUIRIES MAY BE MADE THROUGH ELIZABETH COLASURDO (SEE COVER FOR ADDRESS) OR DIANE DE WITT.